RC OMG

Outstanding Model Gear

POLARIS DR-30A

STOCK

Please read the manual carefully before using

Thanks for purchasing our Electronic Speed Controller (ESC). As brushless systems are with strong power, to avoid equipment damage and personal injury caused by improper use, it is strongly recommended that users should read this manual before using the product, and strictly follow the prescribed operating procedures.

No liability shall be assumed for any equipment damage and personal injury resulting from the improper use of the product, including but not limited to compensation for indirect loss.

At the same time, we assume no liability for any equipment damage and personal injury caused by unauthorized modification of the product.

We reserve the right to change the design, appearance, features, and use requirements without notice.

Caution

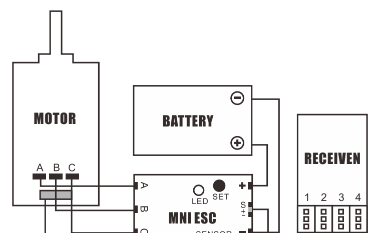
- ◇ Do not let children use this product without the supervision of an adult.
- ◇ The ESC might get hot during use, be careful when handling it.
- ◇ When soldering input / output wires and connections, set the iron to 60W minimum.
- ◇ Always disconnect the battery after use, do not store with the battery connected.
- ◇ Do not use near ßammable materials.
- ◇ If the ESC overheats, emits smokes or burns, immediately discontinue use, disconnect the battery and seek assistance.

Features

- ◆ Full aluminum case and heat sink design, with highly efficient heat dissipation system.
- ◆ Plenty of adjustable parameters allows adjusting the settings for most of racing, such as Modified, stock, zero timing, drifting etc.
- ◆ 32-bit microprocessor can support more powerful processing capability and more accurate motor output.
- ◆ Enhanced throttle response, excellent acceleration, linearity and drive ability.
- ◆ Multiple protection features: Low voltage cut-offprotection, over-heat protection and throttle signal loss protection.
- ◆ Built-in Bluetooth allows programming the parameter settings and firmware upgrades via app (support real time programming,no need restart the esc).
- ◆ Data logging for real-time maximum ESC temperature, motor RPM, Voltage and Adv. Timing and so on.

SpeciÞcation

Product Name	Mini-Z ESC	160A	150A	160A
Cont. Current	30A	160A	150A	220A
Burst Current	80A	760A	950A	1000A
Input Voltage	2-3S	2-3S	2-6S	2-4S
BEC Output	6.0V/2A	6.0V,7.4V/4A	6.0V,7.4V/6A	6.0V,7.4V/6A
Size(L*W*H)	23.5x13.7x9.8	37.0x38.2x31.5	55x48x37.5	55x40x36.5
Weight	9.5	96	165	155
ESC Programming Via	Mobile Phone APP	Mobile Phone APP	Mobile Phone APP	Mobile Phone APP
Firmware Upgrade	Supported	Supported	Supported	Supported
Waterproof	NO	NO	NO	NO
Car Applicable	1/28th	1/10th	1/8th	1/8th



Battery Wire Connection---When connecting the battery, pay attention to polarity: incorrect connection will damage the ESC and Battery. As shown in the figure above, connect the positive (+) wire is connected to (+) battery port, and the negative (-) wire I s connected to the (-) battery port. Motor Wire Connection ---1. Sensored Mode :When using a sensored brushless motor, the three A/B/C ESC wires must connect to the three A/B/C motor wires correspondingly. It is necessary to connect the Sensor wire to the "Sensor" socket on the ESC. Don't change the wires sequence optionally. 2. Sensorless Mode: When using a sensorelesss brushless motor, the #A, #B, #C wires of the ESC can be connected with the motor wires freely (without any sequence). If the motor runs in the opposite direction, please swap any two wire connections.

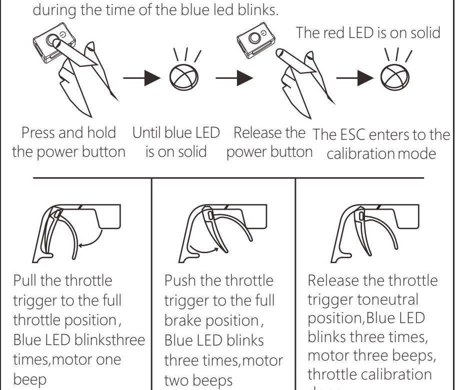
Receiver Wire Connection---The signal wire supplies 6.0V to the receiver, servo, etc. So there is no need to connect an additional battery. External power connected to the receiver may damage the ESC.

Software Functions and Settings

Power On/Off ESC---1. Press the power button then the ESC will be powered on. 2. Press and holding the power button until the all LEDs died out, then the ESC will be powered off. (Note: Please place the throttle trigger on the neutral position: within 10%, otherwise the ESC can not be powered off.)

Throttle Calibration

1. Connect the ESC with the battery and receiver well, then turn on the transmitter.
2. Press and holding the power button until the blue LED is on solid, the motor have a long beep at the same time, then release the power button, the red led will be on solid, the ESC enters to the calibration mode.
3. Pull the throttle trigger to the full throttle position, the blue led blinks three times and the motor beeps once, the full throttle position is saved.
4. Push the throttle trigger to the full brake position, the blue led blinks three times and the motor beeps twice, the full brake position is saved.
5. Release the throttle trigger to the neutral position, the blue led blinks three times and the motor beeps three times, the throttle calibration is completed.
6. The ESC can support reverse throttle calibration, if the transmitter throttle set reverse (it means pull the throttle will go to 1000 throttle position/normally is 2000, and push the t hrottle will go to 2000 throttle position/normally is 1000), then you do the throttle calibration the same way as usual (as above), it will not have any effects on the ESC for ward and revers way even if the transmitter throttle set reverse. Remark: No need to restart the ESC again after throttle calibration finished. Do not move the throttle during the time of the blue led blinks.


The red LED is on solid
Press and hold the power button
Until blue LED is on solid
Release the power button
The ESC enters to the calibration mode
Pull the throttle trigger to the full throttle position, Blue LED blinksthree times,motor one beep
Push the throttle trigger to the full brake position, Blue LED blinks three times,motor two beeps
Release the throttle trigger toneutral position,Blue LED blinks three times, motor three beeps, throttle calibration done

Note: When you pull the throttle from neutral position to full throttle position, the Blue LED will blink, and the blink frequency will go faster when the throttlegoes higher.

LED Status	Throttle Position	Blue LED	Red LED
	Neutral	Blinking	OFF
	Full Throttle	ON	ON
	Full Brake	OFF	ON

2. When some protection is activated

The RED LED is always on solid once the power button is pressed.

The RED LED blinks, single flash between every one second. Repeat like "¤ ¤ ¤"indicates that the voltage is abnormal.

The RED LED blinks, double flash between every one second. Repeat like " ¤¤ ¤¤ ¤¤ " indicates that the temperature is abnormal.

The RED LED blinks, single and double flash alternately between every one second. Repeat like "¤ ¤¤ ¤ ¤¤ ¤ ¤¤" indicates that both of the voltage and t emperature is abnormal at the same time.

The RED LED will not have any responds even the voltage or temperature is abnormal if not detect the signal.

The BLUE LED blinks, double flash between every two seconds. Repeat like " ¤¤ ¤¤ ¤¤ " indicates that the throttle is abnormal. (No throttle , or the throttle is not on the neutral position)

Throttle Signal

1. The ESC can support the 450Hz maximum PPM throttle signal.
2. The ESC throttle protection will be activated under the following situation, and the BLUE LED blinks double flash: The throttle trigger do not place on the neutral position when the ESC turns on. Lost the throttle signal.
3. If the ESC lost throttle signal during the operation, the BLUE LED will blink double flash, and the ESC will start to work again until the throttle signal is back to normal.

Sensored & Sensorless

1. The sensore mode is activated once the ESC detected the hall sensor signal at any time.
2. The ESC will work on sensorless mode once the ESC didn't detect the hall sensor signal at any time.
3. The ESC will have a slight power drop and restored soon during the moment of sensored and sensorless mode switching.
4. The PWM driving frequency will be selected automatically by the ESC on sensorless mode, and the manual setting is invalid.
5. It is invalid to set the brake PMW frequency less than 1KHz and forced recognized as 1KHZ, if the ESC is on sensorless mode.
6. Boost and turbo functions are out vailable on sensorless mode.

Boost & Turbo

1. After the boost or turbo timing triggered, the RPM and current will be increased, and the battery /ESC /motor will be heating , so setting the proper timing and timing increased rate, and control the time of timing will effect the battery/ESC/motor service life.
2. The diff erence of the Boost and Turbo Timing: The Boost timing will be triggered even though you do not pull the throttle trigger to the full throttle position. The Turbo timing will be triggered only when you pull the throttle trigger to the full throttle position.
3. The Boost timing plus the Turbo timing is equal to the final opened timing when the throttle reaches its maximum position, and the final total timing is 60 degree (for Beast Pro 150A total timing is 15 degree). For example: If Boost timing set at 45 degree, and Turbo Timing set at 50 degree, so when the throttle reaches its maximum position, the Boost timing will be 45 degree, and Turbo Timing only can be opened at 15 degree.
4. If set the low voltage or over temperature protection, and the protection is activated, then all the timing will be closed.

Protection

1. High Voltage Protection:
If the ESC detected the voltage too high(Higher than the esc standard voltage), when the ESC turns on, and the voltage protection was not set "OFF", then the voltage protection will be activated, and the maximum throttle output will be limited within 50 % . (The high voltage protection only worked on the moment of the ESC turns on , and it will not work on the other stages even it detected the high voltage , once the high voltage protection opened, even though the voltage comes down to the normal voltage, the protection will not be relieved.)
2. Low Voltage Protection:
If the ESC detected the voltage less than the set value at anytime, and this voltage keep for a while, then the low voltage protection is activated, and the maximum throttle output will be limited within 50%.(Once the low voltage protection activated, even though the voltage comes back to normal, the protection can not be relieved.)
3. Thermal Protection:
The output throttle from the ESC will be limited (not over 50 %) with the thermal value you have preset . (The Thermal protection will be dismissed when the ESC temperature drop to 65℃)
4. If t he voltage protection and temperature protection set off, and when the voltage and temperature become abnormal , the LED status will indicates the problems correspondingly , but will not limit the throttle output and will not close all ESC timing.
5. If the ESC detected the motor have the driving problem (like motor rotor locked or motor phase lost problem) which can cause the motor not run smoothly, and when the throttle trigger leave neutral position for a while, then the ESC driving abnormal protection will be activated, and the motor will emit special tone like beep-beep-beep (note: some motors can not beep or beep with a low sound if motor have phase loss problem), and the protection will be closed until you released the throttle trigger to neutral position for 0.2 seconds. If this problem occurs three times continuously, then you have to solve the motor driving problem first, or the protection will exist all the time.

Bluetooth

1. Reset password : When the ESC turns on, press and holding the power button around 10 seconds, the ESC will restore the Bluetooth password to default setting 0000.
2. With RCOMG Bluetooth, connected the RCOMG app to the ESC, the user can program parameters, upgrade firmware and check the real-time data of the ESC on the APP.
3. Due to the range limit of Bluetooth, the operational distance is around 10 meters.(If there are many metals or other strong interference signals or obstacles around will short the operational distance)
4. The Bluetooth name can not be changed.
5. The Bluetooth connecting will be failed during the ESC throttle calibration process.

Programmable Items

1. The user can program parameters at any status if the ESC turns on, and new programmed parameters will be took effect immediately, no need to restart the ESC, it means the programming parameters can be competed online, so it can provide a very intuitive feeling between the before programming and after programming.
There will be some impacts on the battery/ESC/motor if you program some parameters when the motor in a high-speed rotation. For example, if you changed the motor rotation when the motor in a high-speed rotation, then the ESC will drive the motor reverse immediately, but the motor can not be reverse immediately because of its inertia, then it will cause a big current and vibration. Or when the Boost or Turbo timing opened, but you set it offwhen the motor in a high-speed rotation, it also will cause a big current, so we would like to recommend not programming parameters when the motor in a high-speed rotation.
2. The programming parameters are saved in the ESC embedded flash memory, and the flashed card have a limited programming life (around 10K times), so don't program the ESC very often.

Real-time Data

1. The real - time data can be read only when the ESC have the throttle signal.
2. The real- time data is just a reference data with ± 10 % accuracy , if you want to get the more accurate real - time data , you need to use the more professional equipment.
3. The description of the real -time data items:

Item	Description
Input Throttle	The throttle from the Receiver to the ESC
Output Throttle	The throttle from the ESC to the Motor
Voltage	The battery voltage is being read by the ESC
Min. Voltage	The minimum voltage was read by the ESC
Temperature	The ESC temperature
Max. Temperature	The maximum temperature was read by the ESC
RPM	Revolutions per minutes
Max. RPM	The maximum RPM was read by the ESC
Adv. Timing	Advance Timing, The ESC total timing (Boost & Turbo)

Firmware Upgrade

1. If the ESC firmware upgrade failed during the upgrading process, please restart the ESC again, and must upgrade the ESC firmware via the APP again (all the other functions are not available), the ESC will get right after the firmware upgraded successfully.
2. The Red Led will blink a faint light when the ESC in the fimware upgrade mode, and the Blue Led will blink a faint light when the ESC have data transmission.
3. Please do not turn offthe ESC during the time of the ESC firmware upgrading process. (And the ESC only can be switched offafter pressing the power button around 5 seconds)

Programmable Items Description-A

SECTION	设定项名称	设定项说明
THROTTLE	Throttle Response	It indicates how often the ESC performs throttle adjustment.
	Coast	When the throttle value changes from high to low, it will decrease every 0.01 second.For example: the current throttle stick is at 80%, and the next moment is at 30%. If the throttle coast is not turned on, the throttle value will be immediately reduced from 80% to 30%. If it is turned on, the throttle value will be 80%, 70%... 30% dropped so slowly. Note: If the throttle stick is at 0% at the next moment, the throttle value will be equal to 0 immediately. This item only works within the forward throttle range, and has the most obviouse effect at 30% throttle.
	Neutral Range	Throttle midpoint width, the range of the throttle stick in the centered state.
	Min. Throttle	The minimum throttle, limit the throttle value can not be too small, this item can be adjusted according to the RC car configuration, the smaller the lighter car, this item can be adjusted down, so that the RC car can get a very low speed, the larger the heavier car, this item can be adjusted large, it can eliminate the jitter caused by insuficient starting power.
	Minus	Throttle minus, decay the throttle value. For example, if the throttle stick is at 20%, if the decay is not turned on, the throttle value is 20%. After setting it to 1% decay, the output throttle value is 20% * (1-1%) = 19.8%. This item only works within the forward throttle range.
	Minus Range	For example, if it is set to 50%, it means that the throttle below 50% will be used for throttle Minus. This item only works within the forward throttle range.
	Max. Forward force	If it is set to 80%, the actual throttle value is 80% when the throttle stick is at 100% of the forward throttle.
	Max. Reverse force	If it is set to 80%, the actual throttle value is 80% when the throttle stick is at the 100% position of the throttle in the reverse direction.
BRAKE	Brake Response	It indicates how often the ESC will perform the brake adjustment.
	Min. Brake Force	It limits the minimum braking force.
	Max. Brake Force	If the minimum braking force is set larger than the maximum braking force, the maximum braking force is equal to the minimum braking force.
	Fwd. Drag Brake Force	It refers to the braking force when the throttle stick returns to the 0% position from the forward stroke after the RC car moves forward. If it is turned on, the ESC will turn on correspond brake force when the throttle stick at the 0% position.

Programmable Items Description-B

类别	设定项名称	设定项说明
BRAKE	Fwd. Drag Brake Response	It indicates how often the ESC performs drag brake adjustment.
	Rev. Drag Brake Force	Rev drag braking force refers to the braking force when the throttle stick returns to the 0% position from the reverse stroke after the RC car moves backward.
	Rev. Drag Brake Response	It indicates how often the ESC performs drag brake adjustment.
	Brake PWM Freq.	Brake PWM frequency.
BOOST	Boost Timing	Turn on the timing to make the motor get a higher speed.
	Trigger	Boost trigger mode includes throttle trigger and RPM trigger.
	Throttle Threshold	For example, Boost timing is set to 30 degrees, 50% throttle threshold triggers Boost, then the throttle stick reaches 50% position to enable Boost timing, and when the throttle stick reaches 100%, 30 degree timing is enabled. The timing value increases linearly from 50% to 100% throttle.
	RPM Threshold	The Boost RPM triggers the threshold. When the motor reaches the RPM threshold, the set boost timing will be fully turned on.
	Initial Angle	For example, set the boost timing to 30 degrees, 50% of the throttle triggers Boost, the initial angle is 2 degrees, when the throttle is at 50%, the actual boost angle is 2 degrees (if the initial angle higher than the boost timing, then the Þnal angle is the Boost timing initial value).
	Angle Inc. Rate	For example: set the Boost timing to 30 degrees, and the throttle triggers Boost. If the throttle value is instantly increased to 100%, the Boost timing will not reach 30 degrees immediately, but will increase to 30 degrees at the set increasing speed; It is the same when it is set to RPM trigger.
	Angle Dec. Rate	The rate at which the boost timing is reduced to 0 when the boost trigger condition is no longer met.
TURBO	Turbo Timing	Turbo timing is the timing that starts when the throttle stick reaches 100%.
	Turbo Inc. Rate	The speed with the Turbo timing increasing. For di erent motors, if the speed is set too fast, there will be large burst current and the motor will vibrate violently.

Programmable Items Description-C

类别	设定项名称	设定项说明
TURBO	Turbo Dec. Rate	The speed with the turbo timing decreasing. When the throttle stick leaves the 100% position, the conditions for turning on Turbo are no longer met, but the Turbo timing will not be immediately reduced to 0, but will decrease at the set speed. When the Turbo is turned on, the motor speed is very fast. If the Turbo timing value quickly decreases to 0 at this time, the speed decreases too fast, the motor will vibrate severely and reverse high voltage, so please choose the appropriate timing to reduce the speed.
	Delay	Turbo delay refers to a delay after the throttle stick reaches 100% before turning on Turbo.
	Delay Reload	The update time point of the delay. When the timing has been triggered, if the throttle leaves 100% and quickly returns to 100%, whether to delay again or not. Wait: wait until the timing is reduced to 0, then update the delay, and then re-delay; Instant: update the delay as soon as the throttle leaves 100%, and start the re-delay immediately.
GENERAL	Motor Rotation	In some RC cars, under the default rotation, forward and backward are reversed. At this time, setting another motor rotation can correct this error.
	Motor Poles	Set the correct number of motor poles to get the correct Boost RPM trigger threshold. At the same time, players can see the correct motor RPM in the real-time data of the mobile phone APP.
	Running Mode	Running mode includes Forward/Brake, Forward/Brake/Reverse, Forward/Reverse.
	Reverse Mode	Check the below diagram for details
	Drive PWM Freq.	The drive PWM frequency refers to the PWM frequency used when the ESC drives the motor. The lower frequency, the higher acceleration, but the linearity of the throttle becomes worse and feel aggressive throttle feeling. The Higher frequency ,the smoother throttle feeling, but it will cause the temperature of the ESC to rise too fast.
	CutoVoltage	If the ESC detected the voltage less than the set value at anytime, and this voltage keep for a while, then the low voltage protection is activated, and the maximum throttle output will be limited within 50%.(Once the low voltage protection activated, even though the voltage comes back to normal, the protection can not be relieved.)
	CutoThermal	The output throttle from the ESC will be limited (not over 50%) with the thermal value you have preset.(The Thermal protection will be dismissed when the ESC temperature drop to 65℃)
	BEC Output	BEC Output

Trouble Shooting

Trouble Shooting	Possible causes	Solutions
The ESC was unable to start the status LED, the motor, and the cooling fan after it was powered on.	1. No power was supplied to the ESC. 2. The ESC switch was damaged.	1. Check if all ESC & battery connectors have been well soldered or firmly connected. 2. Replace the broken switch.
The motor suddenly stopped or significantly reduced the output in operation.	1. The receiver was influenced by some foreign interference. 2. The ESC entered the battery LVC (Low Voltage Cut off) protection. 3. The ESC entered the thermal (over-heat) protection.	1. Check all devices and try to find out all possible causes, and check the transmitter's battery voltage. 2. The RED LED blinks, single flash between every one second. 3. The RED LED blinks, double flash between every one second.
The motor stuttered but couldn't start.	1. Some soldering between the motor and the ESC was not good. 2. The ESC was damaged (some MOSFETs were burnt).	1. Check all soldering points, please re-solder if necessary. 2. Contact the distributor for repair or other customer services.
The car ran forward/ backward slowly when the throttle trigger was at the neutral position.	1. The neutral position on the transmitter was not stable, so signals were not stable either. 2. The ESC calibration was not proper.	1. Replace your transmitter 2. Re-calibrate the throttle range or Þne tune the neutral position on the transmitter.

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