REEDY POWER BLACKBOX 600Z-G2

OWNER'S MANUAL #27012

INTRODUCTION

Congratulations on your purchase of Reedy's Blackbox 600Z-G2 Zero-Timing Sensored Brushless Competition ESC. The latest electronics technology along with the design and engineering experience that is responsible for 30 World Championship titles has been incorporated into its design.

Track tested and competition proven, Reedy's Blackbox 600Z-G2 is a simple to use, economical, and powerful ESC for entry-level racers competing in spec classes. Excellent throttle and brake feel, a wide range of adjustability using on-board programming or the optional Programmer2 program box, and robust hardware make the Blackbox 600Z-G2 suitable for a variety of racing applications. Pair the 600Z-G2 with a Sonic 540-FT for the ultimate cost-controlled/spec racing set-up.

Please read the following instructions before installing and operating your ESC.

FEATURES

- Lightweight plastic case with compact footprint
- Low-profile heat sink
- Fully adjustable brake and throttle functions
- On-board, single button programming
- Optional PROgrammer2 programming
- Zero-timing ROAR approved software
- Low-resistance circuitry
- Precision throttle and brake control
- Silicone power wires
- Compact external capacitor
- Firmware updateable
- Competition proven

SPECIFICATIONS

|	Blackbox 600Z-G2
Voltage input	7.4/2S LiPo
On resistance (Ω)	0.0018
Continuous current (A)	60
Dimensions (mm)	40.2 x 31.0 x 18.8
Weight w/o wires (g)	37.0
Motor limit	13.5T
BEC	6.0V/3A

SAFETY PRECAUTIONS

This product is a sophisticated hobby product and not a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this product in a safe and responsible manner could result in injury or damage to the product or property. This product is not intended to be used by children without direct adult supervision. It is essential to read and follow all instructions and warnings found in this manual prior to installation, set up, and use for the product to operate properly and to avoid damage or injury.

WARNINGS

- **Never** expose your ESC to water
- **Never** operate your ESC/motor under no load at high RPM
- **Never** apply reverse voltage
- **Always** unplug the battery from the ESC when not in use or while in storage
- **Never** let children use this product without the strict supervision of an adult
- **Never** leave the ESC unattended while powered ON
- **Always** use caution when handling your ESC as it may become extremely hot during use
- **Always** disconnect the battery and stop using the ESC if it begins to act abnormally
- **Always** power ON your transmitter before the ESC and power OFF the ESC before the transmitter

IMPORTANT ESCs that display evidence of contact with moisture, reverse voltage, or internal/external modifications to wiring are not covered under warranty.

POWERING THE ESC ON/OFF
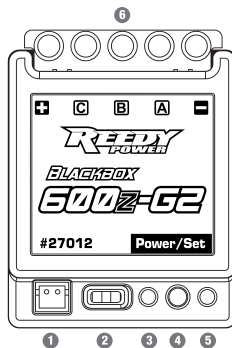
1. To turn the ESC ON, press the Power button.
2. To turn the ESC OFF, press and hold (.1 sec) the Power button or unplug the battery.

1. Fan port
2. RX wire
3. Red LED
4. Power button
5. Green LED
6. Sensor port

INSTALLATION

- Determine the most convenient location to mount your ESC taking into consideration easy access to the battery connectors and Power button
- Determine the ideal sensor wire length and plug it into the ESC and motor sensor ports
- Cut the battery and motor wires to the desired length
- Solder the appropriate battery connector(s) to the battery leads
- Mount your ESC/capacitor unit securely using high quality double-sided tape
- Plug the RX wire into the receiver (refer to radio manufacturer's manual)
- Solder the three ESC motor leads labeled A-B-C to the corresponding motor tabs labeled A-B-C

ESC/RADIO CALIBRATION

1. Plug the ESC into a charged battery and place your vehicle on a stand with the wheels off the ground.
2. Turn on the transmitter and adjust the throttle/brake endpoints to 100% and the throttle trim to neutral.
3. While the transmitter is at neutral, press and hold the Power button until the green LED illuminates and remains solid.
4. While the transmitter is in the neutral position, press the Power button. The green LED will blink until the red LED illuminates and remains solid. The neutral point has been saved.
5. Move the transmitter to the full throttle position and press the Power button. The red LED will blink until both the red and green LEDs illuminate and remain solid. The full throttle position has been saved.
6. Move the transmitter to the full brake position and press the Power button. The red and green LEDs will blink until the green LED remains solid. The full brake position has been saved.
7. Return the transmitter to neutral. The green LED will blink to signify that it is in the neutral position. Note: When the ESC is in Forward/Reverse/Brake mode, the green LED will blink, and the red LED will illuminate and remain solid while at the neutral position.
8. The ESC calibration is complete, and the ESC is ready to use.

IMPORTANT ESC/Radio calibration must be completed with new ESCs, when changing transmitters, after firmware updates, and after repair service.

ADJUSTABLE SETTINGS

Operation Mode – Choose between Forward/Brake (F/B) and Forward/Brake/Reverse (F/B/R) operation.

Drag Brake – Drag Brake is a percentage of the maximum brake available and provides automatic braking when the throttle trigger is returned to neutral. The Drag Brake value may require small adjustments when changes to the Brake Frequency are made. Initial Brake is equal to the drag brake setting and not adjustable.

Power Profile – A higher settings provides a punchier feel which can be beneficial in higher grip applications and track surfaces. Lower settings provide a more linear feel which can be an advantage on low grip surfaces or in lower grip vehicles.

Drive Frequency – A lower frequency will provide a more aggressive throttle feel. A higher frequency will provide a smoother, more precise throttle feel but may also result in higher ESC temperatures.

Brake Frequency – A lower frequency will provide a more aggressive feel while a higher frequency will provide a smoother, more precise braking feel but may result in higher ESC temperatures.

Restore Default – Restores the factory default settings.

CHANGE SETTINGS

The settings of the 600Z-G2 can be changed by using the Power button or by using the Blackbox PROgrammer2 (#27027, sold separately)

Power Button/LED

1. With the ESC ON, press and hold the Power button to enter the Settings Menu. Entry is confirmed when you hear a tone and the green LED blinks. The number of times the green LED blinks, and the accompanying tone, corresponds with the mode being changed. When entering the Settings Menu, you automatically begin at mode #1.

2. Advance to the mode number that you would like to change by pressing the Power button. After each press, you will receive an audible confirmation and a blinking green LED that corresponds to the mode number.

   NOTE: You must allow the LED blinking sequence to finish before pressing the Power button to advance to the next mode.

3. When you have reached the mode that you want to change, press and HOLD the Power button until you hear the audible tone and red blinking LED. The number of blinks of the LED indicates the currently saved value.

4. To change the value, press the Power button to advance to the next value. Continue to press the Power button until you have reached the value that you would like to save indicated by the corresponding number of blinks.

   NOTE: You must allow the LED blinking sequence to finish before pressing the Power button to advance to the next value.

5. Press and HOLD the Power button until you hear the audible tone, and then release the Power button. This stores the value and returns you to the Settings Menu. If you would like to make changes to other settings, return to step #2. Otherwise, proceed to the next step.

6. To save the values you have selected, you must remove power from the ESC by unplugging the battery. Your changes have now been saved and are ready for the next time you hit the track.

Blackbox PROgrammer2

Before using your PROgrammer2 to change your ESC's settings, the appropriate firmware must first be installed using the Blackbox Link PC program. Please visit the 600Z-G2 product page at www.reedypower.com to locate and download the appropriate files. Once the correct firmware has been installed, follow these steps:

1. Plug the ESC's RX wire into Programmer2

3. Press OK after the Blackbox Programmer, PB Firmware Version, and ESC Firmware Version splash screens.

4. Use the ESC and OK buttons to scroll to the desired setting option to be changed.

5. Use the up/down arrow buttons to select the value for that setting.

6. Changes are saved immediately. Once all changes are completed, unplug the Programmer2 extension wire from the ESC.

7. Power OFF the ESC. The new settings will take effect the next time the ESC is powered ON.

Setup sheets obtained from Reedy team drivers can be found at www.ReedyPower.com. These can be extremely helpful in determining good starting setups for your application. Blank editable setup sheets are also available which can be filled out and printed or saved for future reference.

WARRANTY

Your Reedy Blackbox ESC is warranted to the original purchaser for 120 days from the date of purchase, verified by the sales receipt, against defects in material and workmanship. Product that has been mishandled, abused, used incorrectly, used for an application other than intended, or damaged by the user are not covered under warranty. Associated Electrics Inc. is not liable for any loss or damage, whether direct or indirect, incidental or consequential, or from any special situation, arising from the use, misuse, or abuse of this product.

SETTINGS MENU

		VALUE (Red LED)							
		1	2	3	4	5	6	7	8
MODE (Green LED)	1	OPERATION MODE	*F/B	F/B/R	-	-	-	-	-	-
	2	DRAG BRAKE	*0%	5%	10%	15%	20%	25%	30%	35%
	3	POWER PROFILE	LEVEL 1	LEVEL 2	*LEVEL 3	LEVEL 4	LEVEL 5	-	-	-
	4	DRIVE FREQUENCY	2KHZ	*4KHZ	6KHZ	8KHZ	12KHZ	-	-	-
	5	BRAKE FREQUENCY	1KHZ	*2KHZ	3KHZ	4KHZ	6KHZ	-	-	-
	6	RESTORE DEFAULT	*NO	YES	-	-	-	-	-	-

OPERATION AND WARNINGS

Operation	ESC Signal	
	Red	Green
Neutral throttle position F/B Mode		blink
Neutral throttle position F/B/R Mode	solid	blink
Full throttle position		solid
Full brake position	solid	

All LEDs should be off at any throttle/brake position other than neutral, full brake, or full throttle.

Warning	ESC Signal		Motor Power
	Red	Green	
LVC engaged		solid	reduced*
ESC temp cutoff	solid		reduced*
No radio signal	blink alternately		
Sensor wire removed/failure	blink		

*Full operation resumes when the ESC is powered OFF and ON, and the problem that signaled the shutdown has been resolved.

TROUBLESHOOTING

Problem	Cause	Solution
ESC overheats	Motor over-geared	Change final drive ratio (FDR)
	Lack of air flow	Re-position ESC
Motor overheats	Mechanical timing too high	Reduce motor timing
	Insufficient motor cooling	Add cooling fan and/or heatsink
	Weak rotor	Install new rotor
Power speed or performance	Insufficient final drive ratio (FDR)	Change final drive ratio (FDR)
	Transmitter settings changed	Verify correct full throttle setting
	External capacitor unit damaged	Install new capacitor unit
	Incorrect ESC settings	Verify correct settings
	Motor damaged or defective	Inspect and repair necessary components
	Damaged ESC	Return ESC for repair
Motor stutters under acceleration	Damaged sensor wire	Replace sensor wire
	Damaged motor sensor board	Replace sensor board
	External capacitor unit damaged	Install new capacitor unit
	Damaged ESC	Return ESC for repair
No motor power, but servo funcions	ESC plugged into RX incorrectly	Verify RX wire is plugged into Ch. 2
	ESC Temp or Battery Cutoff engaged	Wait for ESC to cool or re-charge battery
	Motor damaged or defective	repair or install new motor
	Motor sensor wire missing or damaged	Install or replace motor sensor wire
	Damaged ESC	Return ESC for repair
No motor or servo power	ESC RX wire plugged in backwards	Plug the RX wire in correctly
	Poor battery connection/defective battery	Improve connection or replace battery
	No radio signal	Check/re-bind TX/RX
	Damaged ESC	Return ESC for repair
ESC works intermittently	Dead or damaged battery	Charge or replace battery
	Bad battery connection	Improve connection or replace battery
	Damaged motor	Repair or replace motor
	Damaged ESC	Return ESC for repair