

# REEDY POWER BLACKBOX

# 1000Z+ PRO

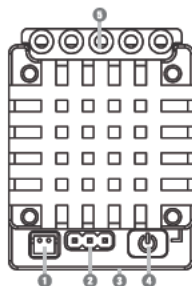
## OWNER'S MANUAL #27033

### 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 port
- Cut the battery and motor wires to the desired length
- Solder the appropriate battery connector(s) to the battery leads
- Mount your ESC and 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.

### POWERING THE ESC ON/OFF

1. To turn the ESC ON, press the Power button.
2. To turn the ESC OFF, press the Power button or unplug the battery.



- ① Fan port
- ② Programming port
- ③ RX wire
- ④ Power button, red/green LEDs
- ⑤ Sensor port

### 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

- 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.
- 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.
- Max. Brake Strength** – Allows changes to the maximum brake strength of the ESC. A setting of 100% is typical when reductions in brake strength are made with the brake EPA adjustment on the transmitter. However, reducing the Brake Strength in the ESC will provide finer resolution in the brake EPA adjustment.
- 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.
- Timing** – Select the amount of timing that is fed to the motor to increase power and top speed. Blinky mode is automatically activated when 0° is selected.
- Operation Mode** – Choose between Forward/Brake (F/B) and Forward/Brake/Reverse (F/B/R) operation.
- Restore Default** – Restores the factory default settings.

### MOTOR LIMIT WARNING

The minimum motor limit for the Blackbox 1000Z+ PRO is 5.5 turns. Please be aware that high grip track surfaces, high ambient temperatures, 4wd vehicles, advanced ESC and motor timing, aggressive gearing, and use of motors that are not suitable for the application increase the load on the ESC resulting in higher operating temperatures. Excessive heat created by the above conditions may result in ESC overheating and thermal shutdown even when using motors 5.5 turns or greater.

### INTRODUCTION

Congratulations on your purchase of Reedy's Blackbox 1000Z+ PRO 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.

Reedy's Blackbox 1000Z+ PRO is a simple to use, economical, and powerful ESC that features timing options for modified class racers as well as zero-timing blinky mode for spec class racers. Excellent throttle and brake feel, a wide range of adjustability, and robust hardware make the Blackbox 1000Z+ PRO suitable for a variety of racing applications.

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

### FEATURES

- Machined aluminum heat-sink upper case
- Compact footprint
- Lightweight case with compact footprint
- Fully adjustable brake and throttle functions
- On-board, single button programming
- Optional PROgrammer2 programming
- Zero-timing ROAR approved software
- Timing options for modified racing
- Low-resistance circuitry
- Precision throttle and brake control
- Solder tabs for easy wire placement
- 13-gauge power wires
- Compact external capacitor board
- Firmware updateable
- Competition proven

### SPECIFICATIONS

	Blackbox 1000Z+ PRO
Voltage input	2S LiPo
On resistance (Ω)	0.00014
Continuous current (A)	100
Dimensions (mm)	40.8 x 31.0 x 20.7
Weight w/o wires & fan (g)	45
Motor limit	5.5T
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.

### WARRANTY

Your Reedy Blackbox 1000Z+ PRO 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.

## CHANGE SETTINGS

The settings of the 1000Z+ PRO can be changed by using the Power button or by using the Blackbox PROgrammer2 (#27027, sold separately)

### POWER BUTTON/LED

- 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.
- 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.
- 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.
- 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.
- 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.
- 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 1000Z+ PRO product page at [www.reedypower.com](http://www.reedypower.com) to locate and download the appropriate files. Once the correct firmware has been installed, follow these steps:

- Plug the Programmer2 extension wire into the programmer port on the ESC.
- Power ON the ESC.
- Press OK after the Blackbox Programmer, PB Firmware Version, and ESC Firmware Version splash screens.
- Use the ESC and OK buttons to scroll to the desired setting option to be changed.
- Use the up/down arrow buttons to select the value for that setting.
- Changes are saved immediately. Once all changes are completed, unplug the Programmer2 extension wire from the ESC.
- 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](http://www.ReedyPower.com). These can be extremely helpful in determining good starting setups for your individual application. Blank editable setup sheets are also available which can be filled out and printed or saved for future reference.

## SETTINGS MENU

\*DEFAULT SETTING, \*\*ONLY ACTIVE AT FULL THROTTLE

		VALUE (RED LED)								
		1	2	3	4	5	6	7	8	
MODE (GREEN LED)	1	DRAG BRAKE	*0%	5%	10%	15%	20%	25%	30%	35%
	2	BRAKE FREQUENCY	1KHZ	2KHZ	*3KHZ	4KHZ	6KHZ	-	-	-
	3	MAX. BRAKE STRENGTH	65%	70%	75%	80%	*85%	90%	95%	100%
	4	POWER PROFILE	LEVEL 1	LEVEL 2	*LEVEL 3	LEVEL 4	LEVEL 5	-	-	-
	5	DRIVE FREQUENCY	2KHZ	4KHZ	6KHZ	*8KHZ	12KHZ	16KHZ	24KHZ	32KHZ
	6	TIMING**	*0°	3°	6°	9°	12°	15°	-	-
	7	OPERATION MODE	*F/B	F/B/R	-	-	-	-	-	-
	8	RESTORE DEFAULT	*NO	YES	-	-	-	-	-	-

## OPERATION

Operation	ESC Signal		
	Red	Green	Motor Power
Neutral throttle position F/B Mode	-	0° blinky	timing
Neutral throttle position F/B/R Mode	-	blink	solid
Full throttle position	-	solid	solid
Full brake position	solid	-	-

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

## WARNINGS

	ESC Signal		
	Red	Green	Motor Power
LVC engaged	-	0° blinky	timing
ESC temp cutoff	solid	solid	reduced*
No radio signal	blink alternately		-
Sensor wire removed/failure	blink	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-gearred	Change final drive ratio (FDR)
	Lack of air flow	Reposition ESC
	Extreme conditions	Install ESC cooling fan
Motor overheats	Mechanical timing too high	Reduce motor timing
	Insufficient motor cooling	Add cooling fan and/or heatsink
	Weak rotor	Install new rotor
Poor speed/performance	Extreme conditions	Install ESC cooling fan
	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 stutters under acceleration	Motor damaged or defective	Inspect and repair necessary components
	Damaged ESC	Return ESC for repair
	Damaged sensor wire	Replace sensor wire
	Damaged motor sensor board	Replace sensor board
	External capacitor unit damaged	Install new capacitor unit
No motor power, but servo functions	Damaged ESC	Return ESC for repair
	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
No motor or servo power	Damaged ESC	Return ESC for repair
	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



CE  
Associated Electrics, Inc. declares that this product complies with the essential requirements and other relevant provisions of the European directive 2014/30/EU.

The crossed-out wheeled bin means that within the European Union the product must be taken to separate collection at the product's end of life. Do not dispose of these products as unsorted municipal waste.

