

Drive Frequency (3C Drive Freq) - 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.

Dead Band (3D Dead Band) - Adjusts the percentage of trigger movement available before the throttle/brake initially engages.

Current Limiter (3E Current Limiter) - Adjusts the maximum amount of current allowed upon motor start up. Limiting current can reduce wheel spin, lower temperatures, and increase run time. A value of 100% means the limiter is disabled while reducing the value provides increased limiting.

MOTOR POWER - EXPERT

The Blackbox 510R ESC features advanced settings that allow individual adjustment of acceleration (Boost) and top speed (Turbo) timing. These are particularly useful on large tracks in applications such as 1/10 Modified

Touring Car and Spec classes where ESC timing is permitted. Each setting can be used individually or together to achieve maximum speed. If you choose to leave both the Boost and Turbo timing settings at 0, the ESC will operate in blinky zero-timing mode.

Boost Timing (4A Boost Timing) - Sets the maximum advanced timing when the motor reaches the Boost End RPM.

Boost Start RPM (4B Boost ST RPM) - Sets the RPM at which Boost Timing begins.

Boost End RPM (4C Boost End RPM) - Sets the RPM at which Boost Timing ends.

Boost Throttle Limit (4D B. TH Limit) - When activated, this setting sets the maximum Boost Timing available in proportion to the throttle position. The setting value represents the maximum Boost Timing at 50% throttle.

Turbo Timing (4E Turbo Timing) - The maximum timing added during Turbo Timing activation.

Turbo Start RPM (4F Turbo ST RPM) - Sets the RPM at which Turbo Timing is activated and only if the Boost ST RPM is set to RPM or Full TH+RPM.

Turbo Activation (4G Turbo Act) - Determines how Turbo Timing is activated. The Full TH setting activates Turbo Timing when the throttle is kept at 100% and the Turbo Delay time has elapsed. When backing off the throttle to less than 100%, Turbo Timing is deactivated. The RPM setting activates Turbo Timing when the motor RPM reaches the Turbo ST RPM value. When motor RPM drops below the defined Turbo ST RPM value, Turbo Timing is deactivated. Full TH+RPM activates Turbo Timing when both the Full TH and RPM conditions are met and is deactivated when one of the conditions is no longer met.

Turbo Delay (4H Turbo Delay) - Once maximum throttle is detected, the ESC delays Turbo Timing activation using this setting and is only enabled when Turbo Activation is set to Full TH or Full TH+RPM.

Slow Rate (4J Slow Rate) - Sets the rate at which the ESC adds Turbo Timing. A higher value adds timing faster while a lower value adds timing more slowly.

Release Rate (4K Release Rate) - Sets the rate at which the ESC reduces Turbo Timing. A higher value reduces timing faster while a lower value reduces timing more slowly.

MOTOR POWER - STANDARD

For those that need additional power but who prefer not to deal with complicated timing settings, the detailed settings have already been worked out for you.

Timing Level (5A Timing Level) - When racing Spec classes and classes that require the use zero-timing blinky mode, select Level 0. Level 1-10 activates Turbo Timing to increase power output and top speed which is useful when racing off-road vehicles on larger and/or high-grip tracks and in the Modified TC classes.

MISCELLANEOUS CONTROL

Run Mode (5A Run Mode) - Select the appropriate mode depending on if the ESC is used for racing or for practice.

Reverse Power (5B Reverse Power) - Adjusts reverse power when For/Brake/Rev has been selected as the Run Mode.

Low Voltage Battery Cutoff (5C Batt Cutoff) - Select the cell voltage at which the ESC will power off to prevent over-discharge of the battery. Disabling the cutoff is an option but not recommended for most racing applications.

ESC Temperature Cutoff (5D ESC Temp Cut) - The temperature at which the ESC will cut power to the motor to prevent permanent damage to the ESC. Disabling the cutoff is an option but not recommended and doing so will void the warranty.

Motor Rotation (5E Mot Rotation) - Reverses the motors direction of rotation if required by a vehicle's design.

BEC Voltage (5F BEC Voltage) - Either 6.0V or 7.4V can be chosen to match the input voltage requirements of the selected servo. Unless HV servos are being used, 6.0V is recommended.

Reset Default Settings (5G Reset Default) - Restores the factory default settings.

TELEMETRY

Motor RPM Memory (7A RPM Memory) - Recall the maximum motor RPM from your most recent run. The data is stored in memory until the next time the ESC is powered on and operated.

ESC Temperature Memory (7B Temp Memory) - Recall the maximum ESC temperature from your most recent run. The data is stored in memory until the next time the ESC is powered on and operated.

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.

SETTINGS MENU						
	Tuning Mode		Standard, Expert			
Brake	1A	Drag Brake	0%, 4%, 8%, 10%, 12%, 16%, 20%, Custom 0% - 100% (1% increments)			
	1B	Brake Stgth	Custom 0% - 100% (1% increments), 40% - 100% (5% increments)			
	1C	Init Brake	= Drag Brake, 0%, 6%, 12%, 16%, Custom 0% - 100% (1% increments)			
	1D	Drag Freq	=Brk Freq, 800Hz, 1KHz, 1.5KHz, 2KHz, 2.5KHz, 3KHz, 4KHz, 6KHz, 8KHz, 12KHz			
	1E	Brake Freq	800Hz, 1KHz, 1.5KHz, 2KHz, 2.5KHz, 3KHz, 4KHz, 6KHz, 8KHz, 12KHz			
	1F	Brake Punch	Level 1-10			
Dynamic Drag Brake	Standard		Expert			
	Unavailable		2A	Dynamic Drag	0% - 100% (1% increments)	
			2B	Drag SW RPM	500, 1000 - 89000 (1000 increments)	
			2C	Max Ddrag RPM	1000 - 70000 (1000 increments)	
			2D	Drag Rel Rate	Fastest, 100RPM/% - 5000RPM/% (100RPM/% increments), Hold	
Throttle	3A	Punch Ctrl	Level 1-10			
	3B	Init Throttle	0% - 15% (1% increments)			
	3C	Drive Freq	1KHz, 2KHz, 3KHz, 4KHz, 6KHz, 8KHz, 12KHz, 16KHz, 24KHz, 32KHz			
	3D	Dead Band	2% - 12% (1% increments)			
	3E	Current Limit	20% - 100% (1% increments)			
Motor Power	Standard		Expert			
	5A	Timing Level	Level 0 - 0° Blinky	4A	Boost Timing	0° Blinky - 60° (1° increments)
			Level 1 - 3°	4B	Boost ST RPM	0 - 55000 (1000 increments)
			Level 2 - 6°	4C	Boost End RPM	2000 - 65000 (1000 increments)
			Level 3 - 9°	4D	B. TH Limit	Off, 1° - 60° (1° increments)
			Level 4 - 12°	4E	Turbo Timing	0° - 60° (1° increments)
			Level 5 - 15°	4F	Turbo ST RPM	5000 - 65000 (1000 increments)
			Level 6 - 18°	4G	Turbo Act	Full TH, RPM, Full TH+RPM
			Level 7 - 21°	4H	Turbo Delay	Off, 0.05s - 0.4s (0.05s increments)
			Level 8 - 24°	4J	Slow Rate	3°/0.1s - 22°/0.1s (1° increments), Fastest
			Level 9 - 27°	4K	Release Rate	3°/0.1s - 22°/0.1s (1° increments)
			Level 10 - 30°			
Misc. Control	5A	Run Mode	For/Brake, For/Brake/Rev			
	5B	Reverse Power	25% - 100% (25% increments)			
	5C	Batt Cutoff	None, 3.2V/cell, 3.4V/cell			
	5D	ESC Temp Cut	Off, 176F/80C, 194F/90C			
	5E	Mot Rotation	Normal/Reverse			
	5F	BEC Voltage	6.0V, 7.4V			
	5G	Reset Default	No/Yes			
Telemetry	7A	RPM Memory	(no selection required)			
	7B	Temp Memory	(no selection required)			
Profiles	8A	Save Profile	Profile A, Profile B, Profile C, Profile D, Profile E, ESC			
	8B	Load Profile	Profile A, Profile B, Profile C, Profile D, Profile E			

TROUBLESHOOTING

Problem	Cause	Solution
ESC overheats	Motor over-geared	Change final drive ratio (FDR)
	No ESC fan or damaged ESC fan	Install fan/new fan
	ESC Temp Cut set too low	Increase ESC Temp Cut value
Motor overheats	Lack of air flow	Reposition ESC
	Mechanical timing too high	Reduce motor timing
	Insufficient motor cooling	Add cooling fan and/or heatsink
	ESC timing settings too high	Reduce timing settings
	Weak rotor	Install new rotor
Poor speed/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
Motor stutters under acceleration	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
	Damaged ESC	Return ESC for repair
No/reduced motor power, but servo functions	ESC plugged into RX incorrectly	Verify RX wire is plugged into Ch. 2
	ESC Temp or Batt 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 and 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	Batt Cutoff voltage set too low	Reduce battery cutoff voltage
	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

OPERATION AND WARNINGS

Operation	ESC Signal		
	Red	Green	
		0° Blinky	Timing
Neutral throttle position F/B Mode		blink	solid
Neutral throttle position F/B/R Mode	solid	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 brake, or full throttle.

Warning	ESC Signal			Motor Power
	Red	Green		
		0° Blinky	Timing	
LVC engaged	blink			reduced*
ESC temp cutoff	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.

FIRMWARE UPDATES

Firmware for both the Blackbox 510R ESC and Programmer2 can be updated after downloading the appropriate firmware and Blackbox Link installation program. These, along with installation and operating instructions, can be found at www.ReedyPower.com.

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 Electronics 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.

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