

ADDITIONAL INSTRUCTIONS OF STOCK FIRMWARE

The ESC firmware of “100422STOCK” or later version uses **Boost Timing** and **Turbo** technology, which is a great innovation for STOCK racing. For a standard 11.5T STOCK motor, powered by 2S Lipo battery, when the ESC applies the maximum timing to the motor, it runs at an incredible speed more than 110000 RPM, which is much close to the speed of a MODIFIED motor (While using traditional technology, such a 11.5T STOCK motor only runs at about 26000RPM).

But the new technology also has some negative impacts; it brings more power loss and lower efficiency of the whole system. So it is very important to set the programmable items of your ESC correctly.

The followings are the detail instructions about these programmable items.

Item #9 Boost Timing: It is effective throughout the entire throttle range and affects the motor speed in the entire track. Please note this refers to the maximum value of the ESC internal timing, the actual timing is always dynamically changed every moment according to the motor RPM.

Option	1	2	3	4	5	6	7	8
Actual Max Timing (Degree)	0°	3°	6°	9°	12°	15°	18°	21°

Item #12 Turbo Timing: It is the additional timing that added to the Boosting Timing and only effective when the throttle is fully opened, so usually it is useful for long straight track.

Option	1	2	3	4	5	6	7	8	9
Actual Max Timing (Degree)	OFF	1°	2°	3°	4°	5°	6°	7°	8°

Item #13 Boost Start RPM: ESC begins to increase the internal timing when motor speed reaches the Boost Start PRM. A lower Boost Start RPM setting will produce a faster rate of boost because the ESC increases the internal timing earlier.

Option	1	2	3	4	5	6	7	8	9
Motor Speed (RPM)	3000	4500	6000	7500	9000	10500	12000	13500	15000

Item #14 Turbo Delay: This is the time that must expire at fully opened throttle to engage turbo. If the fully opened time of throttle is less than the setting value, the turbo will NOT be activated.

Option	1	2	3	4	5	6	7	8	9
Turbo Delay (Second)	0.0s	0.1s	0.2s	0.3s	0.4s	0.5s	0.6s	0.7s	0.8s

Item #15 Timing Punch: This refers to the RPM increment that triggers the ESC timing increase of 1 Degree. A lower Timing Punch setting will produce a faster acceleration and hotter temperature of the motor.

Option	1	2	3	4	5	6	7
Timing Punch (RPM/Degree)	200	300	400	550	700	850	1000

The different settings of Boost Start RPM and Timing Punch make different internal timing-change curves, which apply different acceleration effect at the motor. We use **END PRM** to present the motor speed when the presetting timing is fully applied at the motor.

END RPM = Boost Start RPM + (Boost Timing + Turbo Timing) * Timing Punch

	Boost Start RPM	Timing Punch	Boost Timing	Turbo Timing	End RPM
Example #A	4500 RPM	200 RPM/°	12°	7°	8300 RPM
Example #B	6000 RPM	300 RPM/°	15°	4°	11700 RPM

Example #A: When motor speed reaches 4500RPM, the ESC begins to increase the internal timing with the step of 1 Degree per 200 RPM increment.

Example #B: When motor speed reaches 6000RPM, the ESC begins to increase the internal timing with the step of 1 Degree per 300 RPM increment.

Because Example #A uses lower Boost Start RPM and lower Timing Punch settings, it products a faster internal timing increase, that means the motor has a faster acceleration, but the motor will be hotter.

SUMMARY

1. To get higher motor speed, please choose higher timing settings.
2. To get faster acceleration, please choose lower Boost Start RPM and lower Timing Punch settings.
3. To get lower motor temperature and long running time, please choose lower timing, higher Boost Start RPM and higher Timing Punch settings.

SUGGESTED SETTINGS

The following settings are suitable for 1/10 scale on-road touring cars, and the motor has an initial mechanical timing (also called: Endbell timing) of 0 to 5 Degree.

Motor	Final Gear Rate	#9 Boost Timing	#12 Turbo Timing	#13 Boost Start RPM	#14 Turbo Delay	#15 Timing Punch
11.5T	6.0-6.5	Option 6	Option 7	Option 5	Option 5	Option 5
13.5T	6.5-7.0	Option 8	Option 7	Option 3	Option 5	Option 2
17.5T	6.0-6.5	Option 8	Option 9	Option 1	Option 5	Option 1



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