



BRUSHLESS ESC DIGITAL PROGRAMMER



The Digital Programmer is a handheld device that allows the user to easily adjust the features of the DuraTrax DE10™ ESC. The programmer is small and lightweight, making it highly portable and easy to take anywhere. This programmer allows the user to fine-tune the adjustable features of the ESC and is also great for quick, easy setup changes while at the track. It also allows the user to download various types of performance data for post-race analysis.

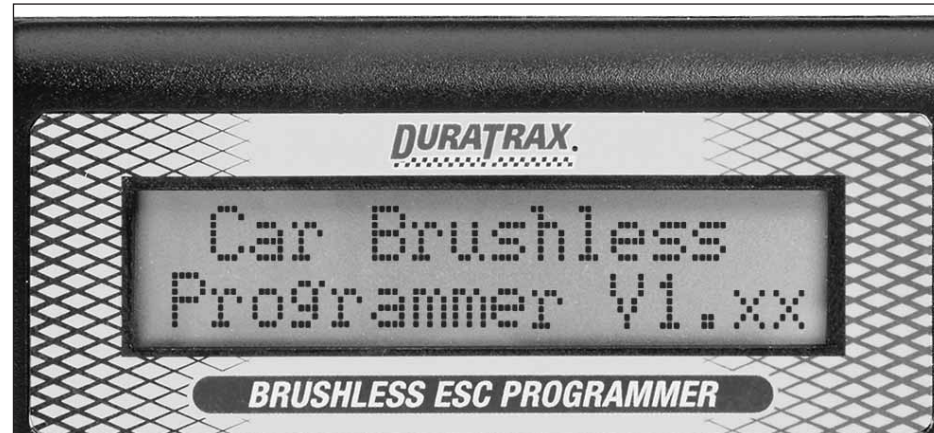
Connecting the ESC to the Programmer



- 1 Connect the ESC to the programmer by plugging the ESC lead into jack located on the top of the programmer.

NOTE: The lead on the ESC is a Futaba J-Type connector and should key into the programmer jack. If you have clipped the tab off of the J-type plug be sure to plug the ESC in properly. If this is not connected properly, the programmer will not power on.

- 2 Connect a battery to the ESC.



- 3 Turn on the ESC's power switch. You should see this screen for approximately 1 second.

NOTE: The screen will automatically change to the first adjustable feature of the programmer (Battery Type selection).

Adjustable Features

Note: These features are adjusted by pressing the ▲ (Up) and ▼ (Down) keys to scroll through the menu and pressing the Increase (INC) and Decrease (DEC) buttons to change the setting. The default values are indicated by **BOLD GREY** letters in this manual.

Every time any of the settings is changed or adjusted, Step 28 must be completed or information will not be sent to the ESC.

- 1 Select Motor Type This allows the user to change the motor type being used. This can be performed at any adjustable feature screen. To change the motor type, press the ▲ (Up) and ▼ (Down) keys simultaneously until the desired motor type is displayed. The motor type will flash and is displayed on the right side of the screen. Please note that the programmer will redirect to the 'Select Battery' screen while this is being performed.

Set: Sensorless ➔ **Sensored** ➔ Brushed ➔ Sensorless
(Can only be cycled in one direction.)

- 2 Select Battery This feature allows the user to change the battery type that is being used. If the battery type is changed, the cutoff voltage is automatically changed to 'Auto' cut off.

Set: LiPo ↔ LiFe ↔ NiCd/NiMH

- 3 Cut-Off Voltage Users can have the ESC automatically set the low voltage cutoff in respect to the type of battery that is being used, or the user can manually set the low voltage cutoff. **Important:** Be sure that the battery is fully charged every time it is plugged into the ESC.

Set: **AUTO** ↔ 3.0V~14.0V (0.1V increments) using INC and DEC buttons.

Each time the battery type is changed, the cutoff voltage is automatically changed to 'Auto' cutoff.

- 4 Power Curve This is similar to exponential, and makes the throttle high side operation quicker or milder.

Set: Soft / **LINEAR** / Hard using INC and DEC buttons.

- 5 Advance Timing Zero degrees of advance is the lowest setting and is displayed by a flashing green light on the ESC when at neutral. Lower timing will increase torque, lower RPM, decrease motor temperatures but provide the longest run time. Increasing the timing will do just the opposite.

Set: 0~25 Degrees (1 degree increments, Sensorless)
Using INC & DEC buttons.

Set: 0~10 Steps (1 step increments, Sensored) using INC & DEC buttons.

NOTE: For sensored type motors, this applies to forward only and it is not applied to brushed motors.

- 6 Acceleration This is the time needed to change from neutral position to max power. Slow reaction when the setting is lowest / max power when setting is the highest.

Set: Lowest ↔ Low ↔ Normal ↔ High ↔ **HIGHEST** using INC & DEC buttons.

- 7 Start Power This mode is designed to set the minimum amount of power delivered to a motor when the motor starts operating from standby. Soft start occurs when setting is the lowest / powerful start when setting is the highest.

Set: **LOWEST** ↔ Low ↔ Normal ↔ High ↔ Highest using INC & DEC buttons.

8 Start Current Limiter This is designed to prevent a car from sliding depending on the surface of the track. Set 'off' for unlimited output. If the throttle stick stays at neutral or brake position for over 10 seconds, this function is applied.

Set: OFF/ 1%~100% using INC and DEC buttons (1% increments).

9 Current Limit This current limiter is ONLY applied to the motor when the motor is rotating to the forward direction. No current limitation is OFF is set.

Set: OFF / 1%~100% using INC & DEC buttons (1% increments).

10 Reverse Function

a. One Way: This mode allows the motor to operate forward only with brakes.

b. Two Way: This mode allows the motor to operate in both forward and reverse.

Set: One way or two way using INC & DEC buttons.

11 Reverse Delay This feature sets the delay time when the direction is changed from forward to reverse.

Set: 0.2s / 0.5s / 0.8s / 1.3s / 1.8s / 2.5s using INC & DEC buttons.

12 Neutral Width Also known as dead band. This feature adjusts the amount of trigger travel between neutral and brake, and between neutral and throttle.

Set: Narrow / NORMAL / Wide using INC & DEC buttons.

13 Motor Direction This feature changes the direction in which the motor turns.

Set: NORMAL or Reverse by using the INC & DEC buttons.

14 Speed Mixing Brake This feature is to set the amount of brake in accordance with the speed of sensored brushless motors. When the speed mixing brake is at 0% the brake feels normal. As you adjust this percentage up you can feel a difference in the way in which braking is applied to the motor.

Set: 0% ~ 100% using INC & DEC buttons.

15 A.B.S. Brake Also known as Pulse Brake. This is similar to pumping the brakes in a full size automobile. This feature is to set ABS brake OFF or the amount of ABS Brake while the throttle trigger is at full brake.

Set: OFF / Weakest / Weak / Normal / Strong / Strongest using INC and DEC buttons.

16 Auto Brake Amount Also known as Drag Brake. This feature is to set the amount of brake when the throttle stick is in the neutral position.

Set: 0% ~ 100% using INC and DEC buttons.

17 Minimum Brake Amount This feature is to set the minimum amount of brake when throttle stick moves to the brake position. (Brake range: Minimum brake amount ~ Maximum brake amount in 1% increments)

Set: 0%~ 30% ~ 100% using INC and DEC buttons.

18 Maximum Brake Amount This feature sets the maximum amount of brake when throttle stick moves to the brake position. (Brake Range: Minimum brake amount ~ Maximum Brake Amount in 1% increments)

Set: 0% ~ 100% using INC and DEC buttons.

19 Current Voltage This screen shows the existing battery voltage.

20 Current Temperature This screen shows the existing temperature on the ESC.

21 Maximum Temperature This screen shows the maximum temperature of the ESC in the previous race.

22 Maximum Current This screen shows the maximum motor current from the previous race.

23 Motor Pole Number This feature is to set the number of motor poles in order to calculate the average and maximum speed of the previous run.

Set: 2 ~ 20 pole using INC & DEC buttons.

24 Gear Ratio This feature is to set gear ratio in order to calculate the average and maximum speed of the previous run.

Set: 2.0:1 ~ 15.0:1 using INC and DEC buttons.

25 Tire Diameter This feature is to set diameter of the tire in order for this programmer to calculate average and maximum speed of the previous run.

Set: 40mm ~ 63mm ~ 200mm using INC and DEC buttons.

26 Maximum Speed This screen shows the maximum speed of the previous run in accordance with motor poles, gear ratio and tire diameter that are set in steps 21~23. This function does not work for brushed motors.

27 Average Speed This screen shows the average speed from the previous run in accordance with motor poles, gear ratio and tire diameter that are set in steps 21~23. This function does not work with brushed motors.

28 Error History This screen is to show what kind of errors occurred in the previous run such as hot temperature, sensor, low voltage and signal.

29 Download This programmer transmits all user setting data to the ESC and if the ESC receives all the data without any errors, the data should be stored at the ESC.

Set: Press the INC button.

30 Restore Memory This function is to recall user setting parameters stored at the programmer.

Restore memory by pressing the INC button.

30 Backup Memory This function is to store user setting parameters in the programmer.

Backup memory by pressing the INC button.

31 Factory Setting This feature allows the user to initialize all parameters and reset to factory default values keeping the existing motor and trigger setup position.

Factory settings are reset by pressing the INC button.

