



**Speedo DX-10 WP45  
Speedo DX-10 WP45-Fan**



**Instruction Manual**



# Dragon - Speedo DX-10 WP45 / Speedo DX-10 WP45-Fan

## Introduction

DRAGON-RC Sensored/Sensorless Brushless Speed Controller

Thank you for your purchasing the DRAGON-RC Brushless Electronic Speed Controller (ESC). DRAGON-RC ESC is specifically designed for operating Sensored/Sensorless brushless motors. We strongly recommend you to read this manual instruction thoroughly before using the ESC.

In case pre-installed in a RTR car, the speedo is fully pre-set and does not need adjusting. In case the speedo is purchased separate, than read the manual carefully and select the right setting to work with your choice of motor.

Check the Dragon-rc website for an update on the manual or software as needed.

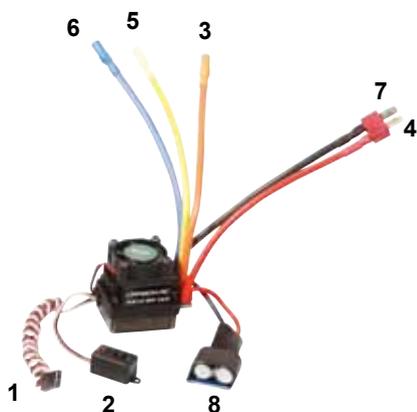
[www.dragon-rc.com](http://www.dragon-rc.com)

## Features:

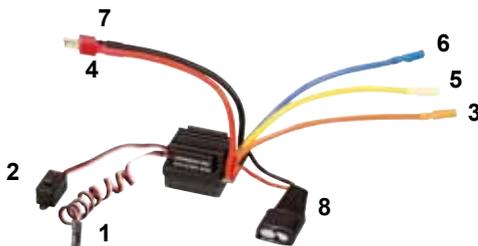
- programmable electronic speed controller with small footprint
- 45A version, waterproof
- to be used for most brushless motors, bot sensored and sensorless
- to be used with max 2 or 3S lipo, or max 6 cell NIMH
- optional program card available

## Begin to Use The New ESC:

Please pay attention to each connection and make sure each assignment is correct.



- 1 Signal wire
- 2 Switch wire
- 3 Orange motor wire C
- 4 Power wire (+)
- 5 Yellow Motor wire B
- 6 Blue motor wire A
- 7 Power wire (-)
- 8 Capacitator wire



## Sensored Mode

When using a Sensored Brushless motor, the Blue motor wire A, Yellow motor wire B and Orange motor wire C of the ESC must be connected with the Sensored motor wire A,B,C accordingly. It is necessary to connect the Sensor wire to the 'Sensor' socket on the ESC. Don't change the wires sequence optionally.

## Sensorless Mode

When using a Sensoreless Brushless motor, the Blue motor wire A, Yellow motor wire B and Orange motor wire C of the ESC can be connected with the motor wires freely. If the motor runs in the opposite direction, please swap any two wire connections.

## Connection to the Receiver

Black wire RX-

Red wire RX+6.0V

White wire RX-Signal

## LEDs:

Conversion of Sensored and Sensorless Function

- When the Power wires on the ESC are connected with the battery pack, the ESC can automatically identify the motor type (Sensored/Sensorless) via indicated LEDs.
- If the ESC works at the status of Sensored, remove the Sensor wire, the ESC can be automatically changed to the status of Sensorless.

Function	LED	LED Status
Low voltage of the battery	Red LED	Blinking
Over-heat of the ESC and motor (95)	Orange LED	Blinking
Sensored motor	Red and Orange LED	ON
Sensorless motor	Orange LED	ON

## Throttle Range Calibration

1. Turn on the transmitter, then connect ESC with the battery packs and set the direction of the throttle channel to REV; set the EPA/ATV value of the throttle channel to 100%.
2. Press and hold the 'Set' button and switch on the ESC, release the button when the **orange LED** turn solid. Pull the throttle trigger to full position, **red Led** light will flash, Led will turn solid and motor beeps once. when system confirms the position.
3. Push the throttle trigger to full Brake position, **red Led** light will flash, Led will turn solid and **motor beeps twice** when system confirms the position.
4. Now trigger goes back to neutral position, both of the **Red Led and Orange Led** blink, Led lights will turn solid and **motor beeps three times** when system confirms the position.
5. **Turn off** the ESC power switch to save the settings.
6. **Turn** the ESC back **on**. You are ready to use the ESC now.



## Programmable items and default settings

Settings below can only be changed by using the optional program card or pc link.

Default settings are shown in the orange boxes

programmable Items	Programmable Value								
	1	2	3	4	5	6	7	8	9
Cut-off Voltage	2.6V/cell	2.8V/cell	3.0V/cell	3.2V/cell	3.4V/cell	No cut-off			
Running Mode	Forward w/o Reverse	Forward with pause then Reverse	Forward/ Reverse						
Motor timing	Very Low	Low	Normal	High	Very High				
Initial Acceleration	Low	Medium	High	Very High					
Throttle Percent									
Reverse	20%	30%	40%	50%	60%	70%	80%	90%	100%
Throttle Limit	0%	20%	30%	40%	50%	60%	70%	80%	90%
Percentage Braking	10%	20%	30%	40%	50%	60%	70%	80%	100%
Percentage Drag Brake	0%	4%	8%	12%	15%	20%	25%	30%	
Motor Rotation	Normal	Reverse							
Neutral Range	2%	3%	4%	5%	6%	10%			

### 1. Cutoff Voltage

#### ● Automatically detect the number of the cells

According to the type of your batteries, set up the type of the batteries and Low Voltage Cutoff Threshold via PC software or program card. The ESC can detect the Voltage of the battery anytime and will lower the power output once the Voltage of the battery is lower than the preset Low Voltage Cutoff Threshold.

● When using **NiMH or NiCd batteries** you do not need to set a cutoff voltage to protect the batteries. If you are using more than 6-cell NiMH or NiCd batteries, you must adjust the cutoff voltage, for example if you are using an 8-cell pack of NiMH batteries you would use a cutoff of 5.6V volts ( $8 \times 0.7V = 5.6V$ ). When the voltage of the batteries packs is within 8.4~12.6V, the ESC will automatically identify 3S LiPos. When the voltage of the batteries packs is less than 8.4V, the ESC will automatically identify 2S LiPos.

- Customized Voltage Cutoff (for NiMH or NiCd Batteries) you can select a starting cutoff voltage of 4, 5, 6, 9 or 12 volts. Then using the up/down to the right of the voltage you can increase the voltage stepping up 0.1V between the selectable settings.
- When using any **Lithium batteries**, they must not be discharged to less than 3.0V per cell.

## 2. Running Mode

- **Forward w/o Reverse**

This is a Race setting - Reverse is disabled.

You will find in racing, most tracks will not allow racing with reverse enabled.

- **Forward with pause then Reverse: (DEFAULT)**

General bashing around (FUN) or racing if reverse is allowed for the event.

The Electronic Speed Controller requires 2 seconds of continuous neutral from the transmitter prior to allowing reverse to operate.

**Note:** *There is automatic protection within the DRAGON-RC ESC. Only after you have stopped and returned the trigger to neutral will reverse become available. If while traveling in reverse, pull the trigger to go forward. This is to help prevent serious damage to the drive train.*

- **Forward / Reverse**

If the option is activated, the RC car could go forward and backward, but couldn't brake.

### ESC – reverse operation

Should you get into a situation that requires reverse, after you have applied any brakes you may have needed, return the throttle trigger to the neutral position.

Wait a moment or two and then push the trigger forward for reverse.

## 3. Motor Timing

This option affects the power band and efficiency (run time) of an electric motor. The default is 'Normal' and is a good starting point to deliver power and provide good run time.

- **Very Low** Provides maximum efficiency with less power. Higher timing produces significantly more power but at the expense of efficiency (less run time) and typically the motor will generate more heat. Each brushless motor will respond to timing differently. Good for running around on paved, or harder surfaces, and racing with high KV rated or low-turn motors

- **Low** Provides power for running through soft surfaces, having fun and longer run time.

- **Normal (Default)** Good mix of power and efficiency using any motor

- **High** More power than efficiency so run time will reduce, and you should be monitoring motor heat. The higher KV or lower turn motors will generate heat quickly using this setting. A safe high temperature range is 165F to 180F (74° - 82° Celsius), going higher may damage your motor.

- **Very high** This is maximum power and must be used with caution.

**Note:** Any motor has the potential to over-heat in this setting. Frequently check the motor temperature and make sure you're not operating higher than 165° and 180° Fahrenheit (74° - 82° Celsius), which may damage your motor, or damage your Electronic Speed Controller (ESC).



#### 4. Initial Acceleration

Use this to limit the initial power that is sent to the motor when starting from a complete stop. Using the **LOW** option, the vehicle will launch very slowly and provide the longest run times. When using the **HIGH** choice, you will have wheel-spinning acceleration at the cost of run time. This is also very tough on the batteries as the amperage draw can be very high. If your vehicle cuts out, hesitates or loses radio control, you should consider setting this at a lower value.

- **Low** - Using this option will provide longer run times and is easiest on the batteries. It is a good choice for beginners.
- **Medium** - Medium requires more from your batteries, and is good for low traction surfaces.
- **High** - This option will provide full acceleration and requires stout batteries to supply the load required in this setting.
- **Very high** - This option will provide full acceleration and requires stout batteries to supply the load required in this setting.

#### 5. Throttle Percent Reverse

Use this to limit the power available using reverse throttle.

The lower the percent or level the less speed will be available in reverse.

20%, 30%,40%,50%,60%( Default),70%,80%,90%,100%

#### 6. Throttle Limit

Use this to limit the power available using forward throttle.

The lower the percent the less forward throttle speed will be available.

0%(Default), 20%,30%,40%,50%,60%,70%,80%,90%

#### 7. Percentage Braking

Gives you the ability to have full control over the amount of brake your vehicle will have.

10%,20%,30%,40%,50%(Default),60%,70%,80%,100%

#### 8. Percentage Drag Brake

0%( Default) 4%,8%,12%,15%,20%,25%,30%

The drag brake function provides the driver a set percentage of brake when you have the transmitter resting in neutral. This will create the 'feel' of a brushed motor.

Drag brake is used in racing to slow a vehicle as you let off approaching a corner versus the driver having to push the brake at every corner.

Try working with this to get a sense of how you might use this for your track.

- If you are running on a high traction track with tight corners, a stronger setting should work best.
- If you are running in an open area, you will find a smaller percentage will result in better control.
- If you are running in dusty or slippery surfaces, you will more than likely want to use the lowest option.

## 9. Motor Rotation

Normal (default), Reverse

## 10. Neutral Range

This setting adjusts the amount of 'Deadband' off neutral on the throttle trigger.

This is in Milli-Seconds (MS) and is the amount of neutral when you pull the trigger.

The smaller the value the less 'Deadband' or movement is required off-center for the ESC to begin throttle functions.

**Using a higher value for this setting will provide a wider Deadband.**

- 2%
- 3%
- 4% (Default)
- 5%
- 6%
- 10%

## Warranty

DRAGON-RC Model has no control over the use, installation, application or maintenance of these products, thus no liability shall be assumed nor accepted for any damages, losses of costs resulting from the use of this item.

Any claims arising from the operating, failure or malfunction etc. will be denied.

We assume no liability for personal injury, property damage or consequential damages resulting from our product or our workmanship.

As far as is legally permitted, the obligation for compensation is limited to the invoice amount of product in question.



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