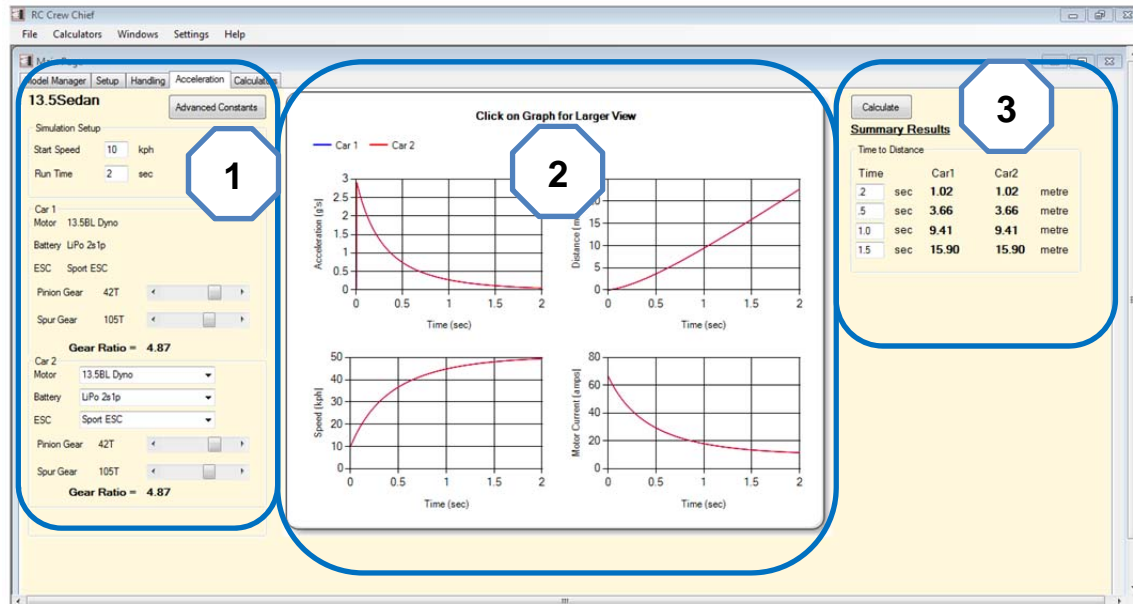


Acceleration Tab

The **Acceleration** tab performs a straight line acceleration simulation comparing two cars setups. The resultant and provides output graphs of acceleration, speed, distance and motor current versus time. There are three key areas on this tab.



Area 1- Simulation Setup

This detailed view of the 'Simulation Setup' section shows the following configuration:

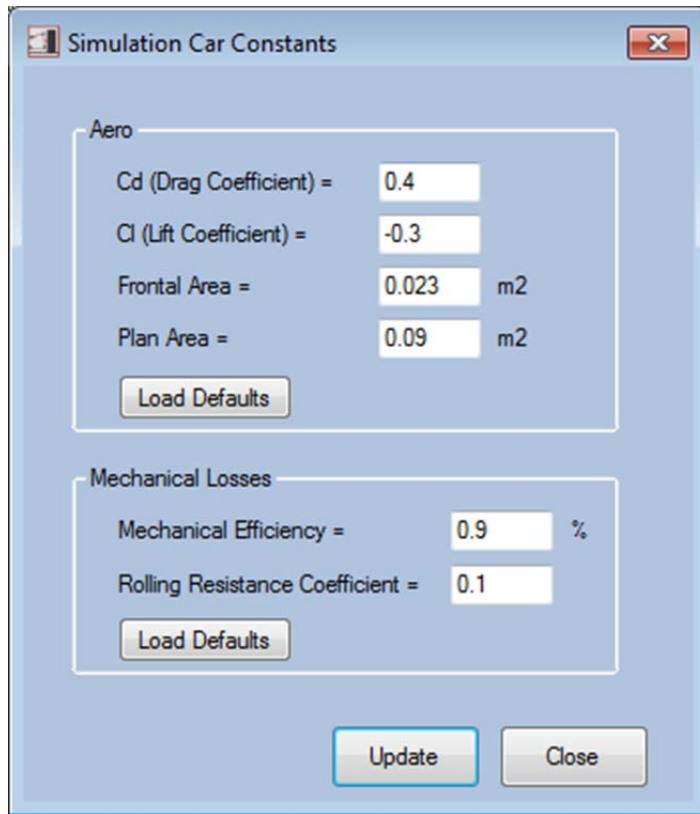
- Model:** 13.5Sedan
- Simulation Setup:**
 - Start Speed: 10 kph
 - Run Time: 2 sec
- Car 1:**
 - Motor: 13.5BL Dyno
 - Battery: LiPo 2s1p
 - ESC: Sport ESC
 - Pinion Gear: 42T
 - Spur Gear: 105T
 - Gear Ratio: 4.87
- Car 2:**
 - Motor: 13.5BL Dyno
 - Battery: LiPo 2s1p
 - ESC: Sport ESC
 - Pinion Gear: 42T
 - Spur Gear: 105T
 - Gear Ratio: 4.87

The two values in the **Simulation Setup** box control the initial speed of the cars and the total execution time of the simulation. Think of the initial speed as corner exit speed.

In the **Car 1** box only the pinion and spur gearing can be adjusted. The Motor, Battery and ESC are fixed based on the selected car on the **Model Manger** tab.

Car 2 has more options allowing selection of any library motor, battery or ESC model. The pinion/spur gearing can also be adjusted.

As any of the values or Car 2 motor, battery or ESC selections are changed the graphs and time to distance values will update.



The image shows a software dialog box titled "Simulation Car Constants". It is divided into two main sections: "Aero" and "Mechanical Losses". The "Aero" section contains four input fields: "Cd (Drag Coefficient) =" with a value of 0.4, "Cl (Lift Coefficient) =" with a value of -0.3, "Frontal Area =" with a value of 0.023 and a unit of m2, and "Plan Area =" with a value of 0.09 and a unit of m2. Below these fields is a "Load Defaults" button. The "Mechanical Losses" section contains two input fields: "Mechanical Efficiency =" with a value of 0.9 and a unit of %, and "Rolling Resistance Coefficient =" with a value of 0.1. Below these fields is another "Load Defaults" button. At the bottom of the dialog box are two buttons: "Update" and "Close".

Category	Parameter	Value	Unit
Aero	Cd (Drag Coefficient)	0.4	
	Cl (Lift Coefficient)	-0.3	
	Frontal Area	0.023	m2
	Plan Area	0.09	m2
Mechanical Losses	Mechanical Efficiency	0.9	%
	Rolling Resistance Coefficient	0.1	

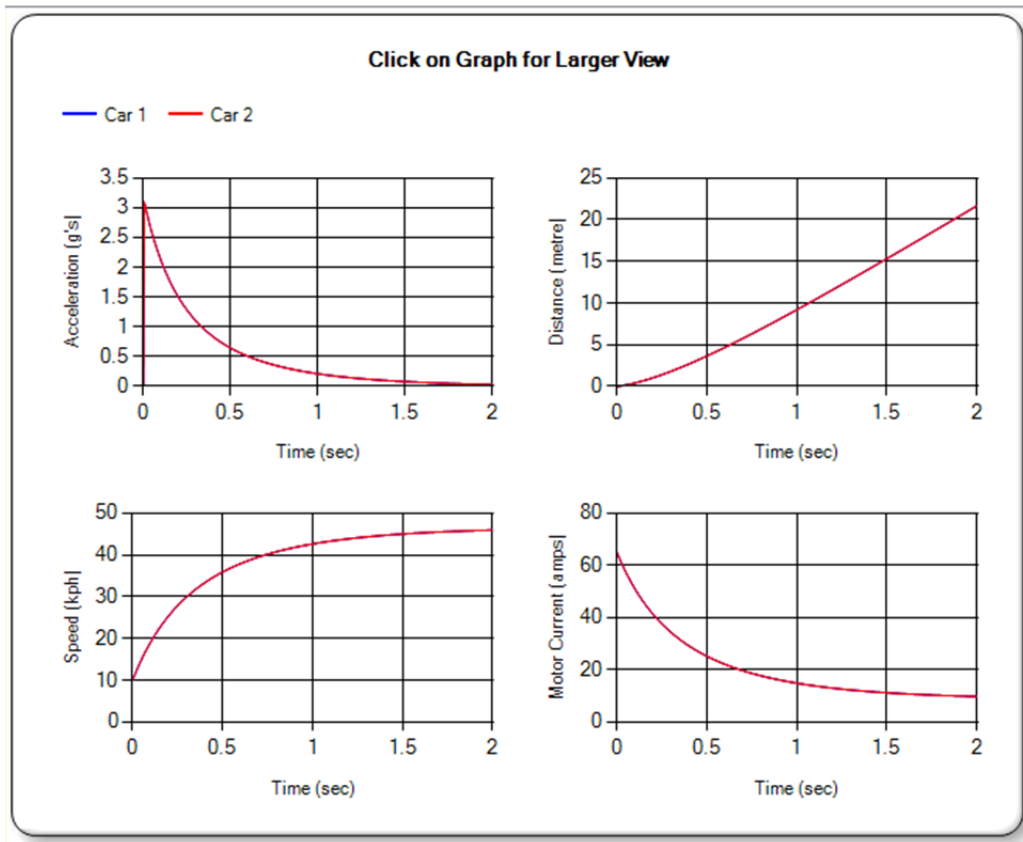
The **Advanced Constants** button opens a form that displays the Aero and Mechanical constants used in the simulation. The default values are representative of a 1/10 scale sedan and have selected based on the results of track testing.

If you change the values click the update button to apply them to the simulation routine.

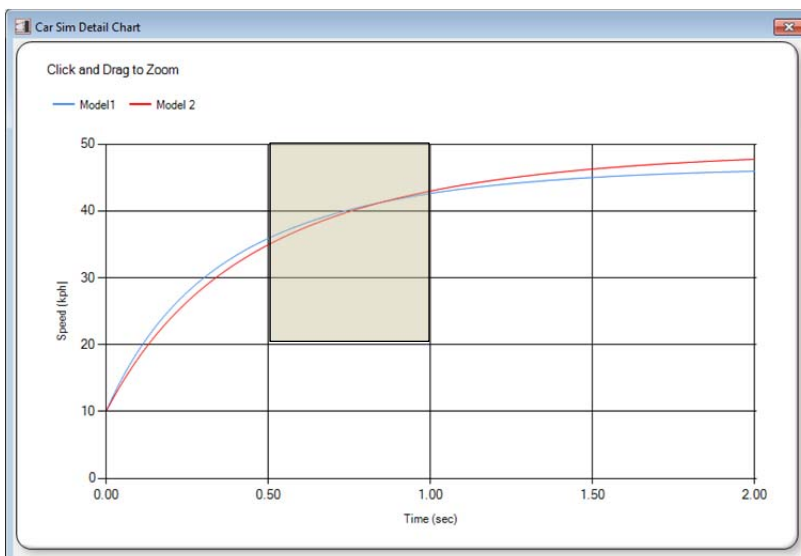
Load Defaults buttons are provided to return to the original settings.

Area 2 –Graphs

The simulation results are presented in four graphs. Acceleration, Speed, Distance and Motor Current plotted versus time. By clicking on one of the graphs a larger view is displayed.



Once the larger graph is displayed it can be zoomed to a specific area by clicking and dragging on the area of interest.



Scroll bars are provided in the zoomed view to allow the graph to be re-positioned. The zoom level can be reset by clicking on the circle at the end of each scroll bar.

Area 3 – Time to Distance

Since the most important part of racing is who gets there first a time to distance summary is provided. Enter times where you want to compare the distance travelled by both cars. Note that the Time entered must be less than the total simulation **Run Time** in Area 1.

Calculate

Summary Results

Time to Distance

Time		Car1	Car2	
<input type="text" value=".2"/>	sec	1.03	0.98	metre
<input type="text" value=".5"/>	sec	3.65	3.49	metre
<input type="text" value="1.0"/>	sec	9.19	8.99	metre
<input type="text" value="1.5"/>	sec	15.30	15.22	metre