F1TENTH Car Parameters

Kinematic Parameters

Parameter	Value
Car Length	0.50 m
Car Width	0.27 m
Wheelbase	0.33 m
Track Width	0.23 m
Front Offset	0.09 m
Rear Offset	0.08 m
Min Turning Radius (@ Max Steering Angle)	0.5716 m
Max Steering Angle (Wheel-Road Angle)	0.523599 rad (30 deg)
Max Speed :warning: Physical Car Limit :warning:	8.9408 m/s (20 mph)

VESC Parametrs

Parameter	Value
Max Steering Rate	3.2 rad/s
Max Acceleration	2.5 m/s2
Min Braking Command	-20000
Max Braking Command	200000
Min Speed Command	-23250
Max Speed Command	23250
Min Braking Command	-20000
Max Braking Command	200000
Min Steering Command	0.15
Max Steering Command	0.85

Notes:

- **Speed Command:** `erpm (electrical rpm) = speed_to_erpm_gain * speed (m/s) + speed_to_erpm_offset`
  - `speed_to_erpm_gain`: 4614
  - `speed_to_erpm_offset`: 0.0
- **Steering Command:** servo_value (normalized 0 to 1) = steering_angle_to_servo_gain * steering angle (rad) + steering_angle_to_servo_offset
  - `steering_angle_to_servo_gain`: -1.2135
  - `steering_angle_to_servo_offset`: 0.435 (zero steer offset)