Motor Block Check-Off

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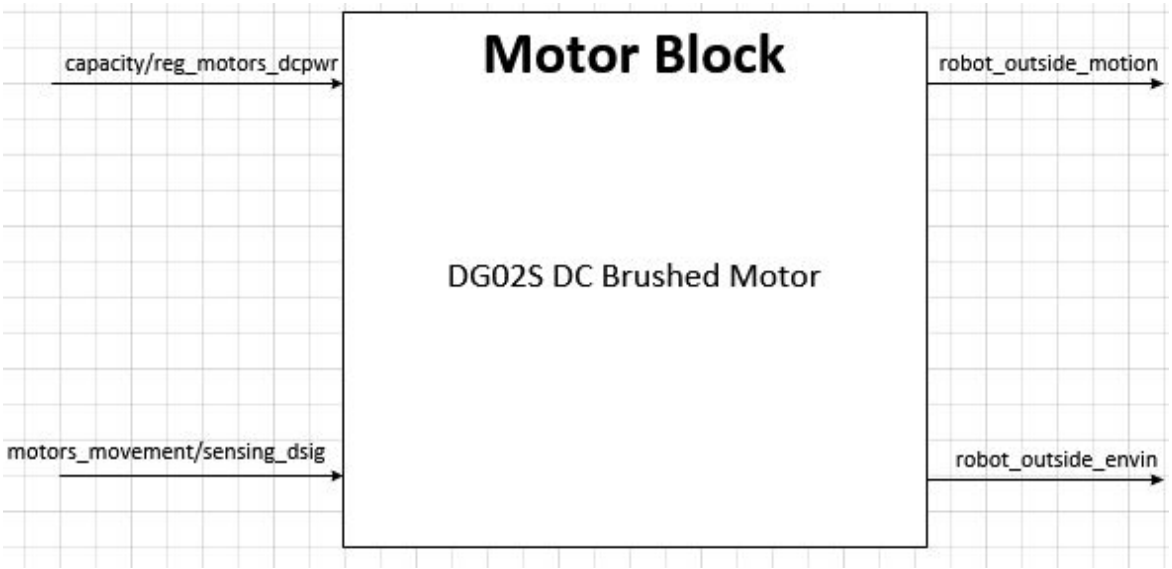
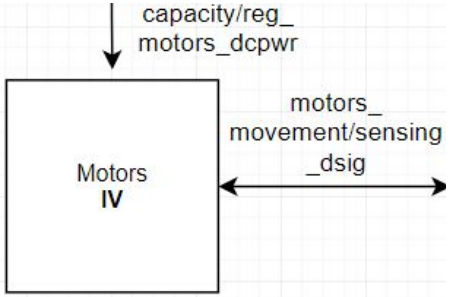
Functional Overview



Interface Verification for System Integration



Interface	Properties
robot_outside_envin	• Surfaces include: tile, short carpet, concrete • Obstacles include: walls, chair legs, cords, clothing
robot_outside_motion	• Speed on all surfaces must be greater than 0.3 m/s • Max speed > 0.3 m/s • 10 min or greater time in motion
capacity/reg_motors_dcpwr	• 3-12 V DC • 0 - 0.7 A • 10% tolerance on input parameters
motors_movement/sensing_dsig	• PWM DC signal powering 2 motors • PWM frequency of 1.6KHz. • Draw of 0 - 0.45A • Duty cycle of 0-40% • 2 active high inputs; 5V high, 0V low

Testing Plan Overview

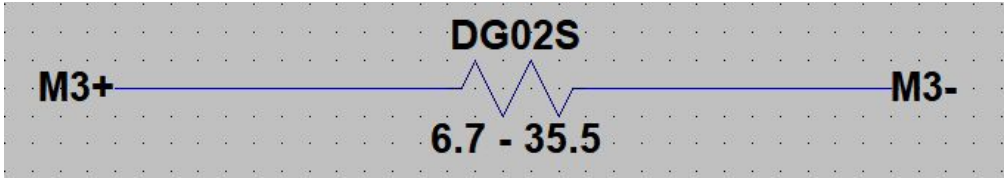
2 Steps:

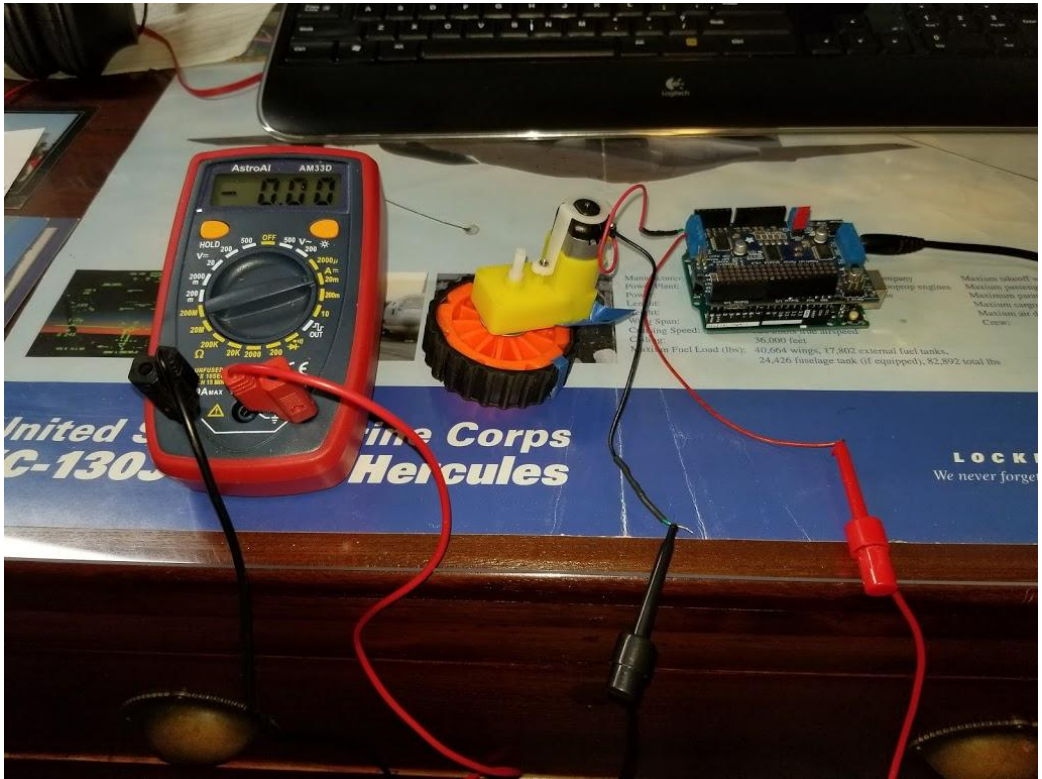
A. Top Speed No Load Test
B. Top Speed Max Current Draw Test

Conclusion:

If the block passes all of the listed tests, all interface properties have been verified and the block is ready for inclusion into the system.

Schematic and Testing Setup





Test Videos

Test A: Top Speed No Load Test

Test B: Top Speed Max Current Draw Test

Test Results

Numerical Results:

A. **V = 3.53V. I = 0.1A. R = 35.5Ω. RPM = 150.**

   Linear Velocity = 0.93m/s

B. **V = 3.35V. I= 0.5A. R = 6.7Ω. RPM = 9.**

   Linear Velocity = 0.33m/s

Results: Passed

Both linear velocities were above the required minimum velocity of 0.3m/s. This demonstrates that the motor block is ready to be incorporated into the system for further testing and should not result in system damage or malfunctions.