

Determine ohmic resistance of motors

May 8, 2019

1 Abstract

The ohmic resistance of the two motors controlling the pan-tilt system gets determined.

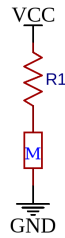
2 Introduction

The ohmic resistance of the motors are the goal to be determined in this journal. Every constant concerning the motor of the topframe is denoted A_t while constants for the bottom frame is denoted A_b .

3 Materials and Methods

To determine the ohmic resistance of the motors a known voltage will be applied, causing a current to flow through the motor. Using Ohm's law we thus can determine the wanted resistance.

The circuit used to determine the resistance for the motor can be seen on figure (3). When executing the experiment a VCC of $12V$ is chosen with a ohmic resistor with resistance $R_1 = 22\Omega$. Measuring the current flowing through the resistor in series with the motor on the top frame, its seen that $I_t \approx 0.449A$.



Doing the same but with the bottom frame, the current measured is $I_b \approx 0.448A$. Thus the resistance of the two motors can be calculated as:

$$VCC = (R_1 + R_{motor,t}) \cdot I_t \Rightarrow R_{motor,t} = \frac{12V}{0.448A} - 22\Omega \approx 4.79\Omega$$
$$VCC = (R_1 + R_{motor,b}) \cdot I_b \Rightarrow R_{motor,b} = \frac{1}{0.449A} - 22\Omega \approx 4.70\Omega$$

4 Results

The result of this experiment is as follows.

$$R_{motor,b} \approx 4.70\Omega$$

$$R_{motor,t} \approx 4.79\Omega$$

5 Conclusion

The resistance of the motor controlling the top frame is $R_{motor,t} \approx 4.79\Omega$ and the resistance of the motor controlling the bottom frame is $R_{motor,b} \approx 4.70\Omega$.