1 Introduction

2 Background/Theory

3 Methods & Materials

3.1 Experimental Set-Up unloaded potentiometer

3.2 Experimental Set-Up with fixed resistor

3.3 Experimental Set-Up with fixed load current

4 The Unloaded Potentiometer

4.1 Measurement Results

Table 1 displays the measured voltage values in terms of k, also displaying the theoretical voltage.

Table 1: Measured and expected voltage in terms of K

K	$Measured\ V$ V	ΔV V	$Expected\ V$ V
0.1	0.302	0.009	0.296
0.2	0.594	0.009	0.592
0.3	0.89	0.017	0.888
0.4	1.184	0.014	1.184
0.5	1.481	0.013	1.480
0.6	1.776	0.021	1.775
0.7	2.076	0.023	2.071
0.8	2.365	0.024	2.367
0.9	2.663	0.025	2.663
1	2.957	0.031	2.959

4.2 Graphs

Figure 4 displays the measured voltage in terms of K.

4.3 Discussion

The main goal of this experiment was to determine the effect of changing the k-value of the potentiometer on the voltage load of the varying resistance. When looking at the graphical representation of these values seen on figure 3, we see a linear relationship between the k-value and the voltage drop on the potentiometer. Analyzing the difference between the measured and expected voltage, we see that the measured values are accurate, as the difference between them and the expected values falls within the measurement error.

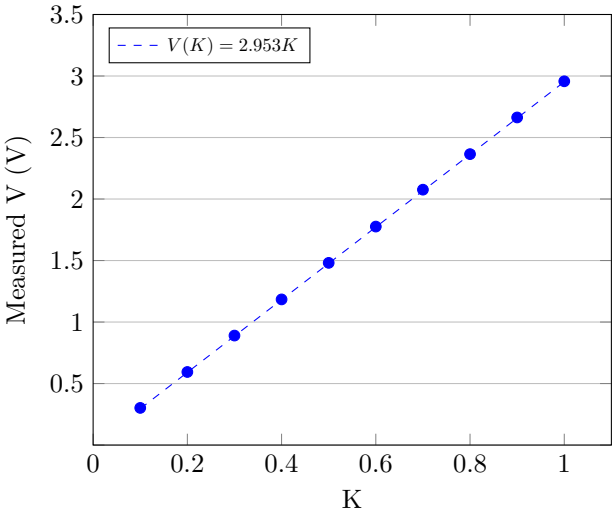

Figure 1: Velocity of the slat in terms of time

5 Potentiometer loaded with fixed resistor

5.1 Measurement results

Table 2 displays the measurements for K, the unloaded potentiometer value, both loads, with their measured and theoretical values, and percent deviations.

Table 2: Measured and theoretical load values in terms of K

K	*Unloaded V* V	*Load* 1 V	*Load* 1 *theoretical* V	*PD* 1 %	*Load* 2 V	*Load* 2 *theoretical* V	*PD* 2 %
0.1	3	0.274	0.156	75.85	0.253	0.111	56.02
0.2	3	0.514	0.329	56.27	0.451	0.239	46.98
0.3	3	0.739	0.522	41.46	0.628	0.388	38.28
0.4	3	0.957	0.740	29.32	0.809	0.562	30.53
0.5	3	1.184	0.987	20.00	0.993	0.770	22.47
0.6	3	1.433	1.269	12.97	1.21	1.022	15.55
0.7	3	1.717	1.594	7.74	1.47	1.334	9.27
0.8	3	2.039	1.973	3.35	1.801	1.730	3.97
0.9	3	2.448	2.421	1.11	2.268	2.249	0.86
1	3	2.952	2.959	0.24	2.948	2.959	0.37

5.2 Graphs

Figure 5 displays the voltage across the load resistor in terms of K, comparing them to the theoretical values, and the voltage drop on the unloaded potentiometer.

Figure 6 displays the relationship between percent deviation and K.

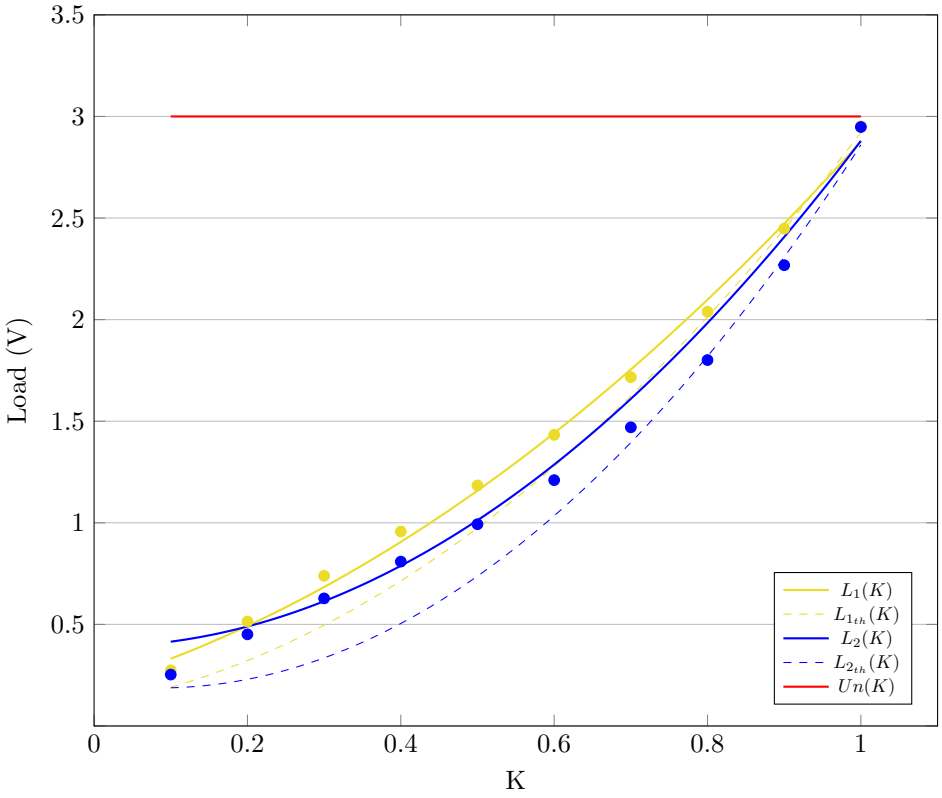

Figure 2: Loads in terms of K