ELEC 313 **Lab Report Guidelines**

Lab reports need not be lengthy documents. Write succinctly, but give enough detail that a reader familiar with basic electrical measurements could reproduce the experiment. Use past tense to describe work done in the lab. Lab reports should be composed on a word processor and printed out.

The lab report should include:

1) Cover page *signed by each team member*
2) Purpose of experiment
3) Block diagram of the test configuration and or circuit schematic(s).
4) Test procedure (Write in your own words. Do not copy from assignment.)
5) Measured results

   Give the units of each measurement. However, if the data appears in a table, attach the unit to only the first entry in each column.
6) Comparison with theoretical results

$$\%error = \frac{measured - theoretical}{theoretical} \times 100\%$$

7) Conclusion(s)

As an example, suppose that the lab assignment is:

1) Select two resistors at random from a supply box.
2) Determine their nominal values from their color-coded bands.
3) Measure the resistance of each and compare it with the nominal values.
4) Connect the resistors in series and measure the resistance of the combination.

A lab report documenting the results in the desired format appears on the next three pages.

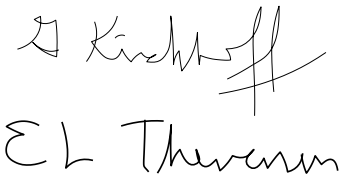
ELEC313-01

Technical Report for Lab Assignment #0

Resistor Combination in Series

Submitted by:

G. Kirchhoff
E.L. Thevenin



Date of Submission

Purpose

This laboratory provides experience in the measurement of resistors and their series combination. It verifies the equivalence formula for combining resistors in series.

Test configuration

Figure 1: Test Configuration

Circuit tested

The test sample comprised two resistors connected in series as shown in Figure 2.

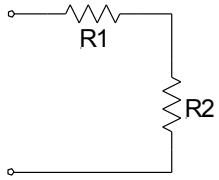


Figure 2: Series Resistor Circuit

Test procedure

Two resistors were selected at random from the supply box. The nominal value of each resistor was determined by examining the color-coded bands around each. The measured value was then established using the resistance function on the multimeter and recorded in Table 1. Next, the resistors were connected in series on the breadboard according to the circuit in Figure 2 and the resistance of their combination measured using the test configuration in Figure 1 and recorded in Table 2.

Measured results

	Nominal	Measured	Deviation from Nominal
R1	1000 Ω	1026 Ω	2.6%
R2	3900	3854	–1.2

Table 1: Individual resistors

	Nominal	Measured	Deviation from Nominal
R_{eq}	4900 Ω	4881 Ω	–0.4%

Table 2: Series combination

Comparison with theoretical results

When two resistors, R_1 and R_2, are connected in series, resistance of the combination is expected to be

$$R_{eq} = R_1 + R_2$$

Using the measured values from Table 1 of 1026 and 3854 Ω, respectively, predicts a series equivalent of

R_{eq} = 1026+3854 = 4880 Ω.

The measured value from Table 2 of 4881 Ω represents an error of 0.02% from theoretical.

Conclusion

Within experimental error, this laboratory exercise has demonstrated that the equivalent resistance of two resistors connected in series is equal to the sum of the individual values.