BSE 104 - Physics II

Experiment 04

Applications on Ohm's Law

#	Student ID	Student Name	Grade (10)
1			
2			
3			

Experiment (4.1)
Serial connection of Omic Resistors

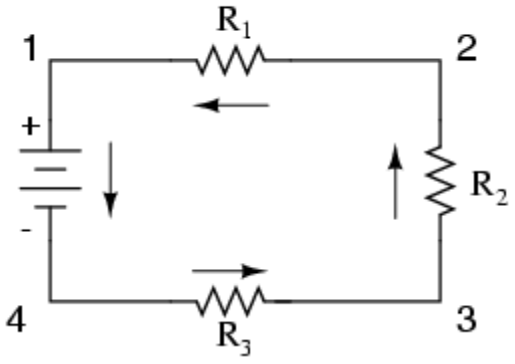
Objective

- To examine the series connection of series resistors, calculating the equivalent resistance using ohm's law.

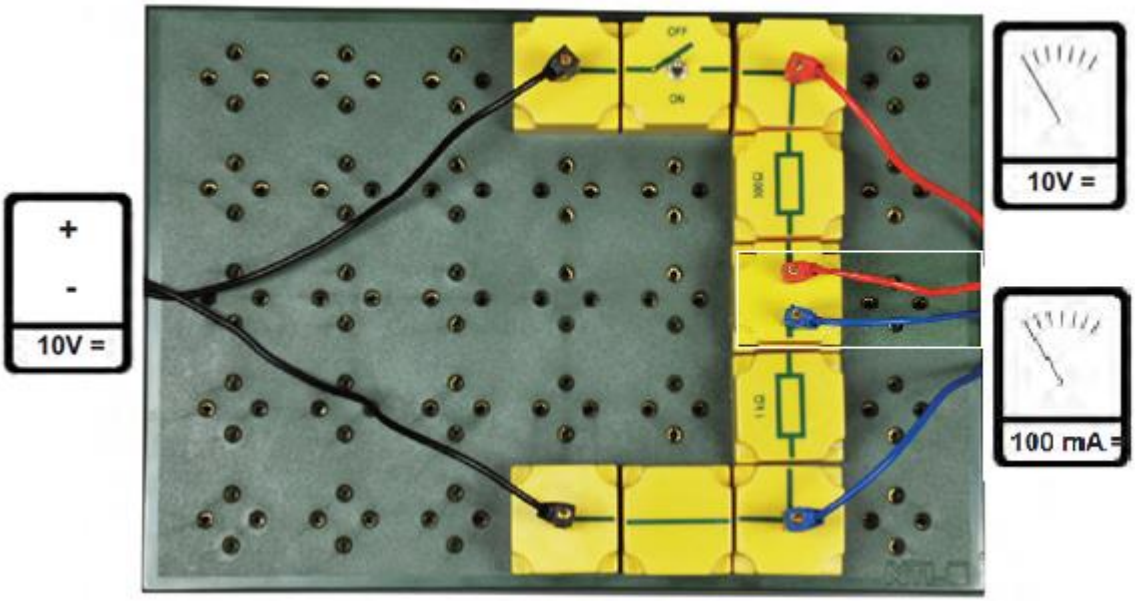
Theory

- A series circuit is defined by a single loop in which all components are arranged in daisy-chain fashion. The current is the same at all points in the loop and may be found by dividing the total voltage source by the total resistance.
- The voltage drops across any resistor may then be found by multiplying that current by the resistor value.
- Consequently, the voltage drops in a series circuit are directly proportional to the resistance.
- This states that the voltage across any resistor (or combination of resistors) is equal to the total voltage source times the ratio of the resistance of interest to the total resistance.

Series



Procedure



- Arrange connections as shown above
- Apply voltage as indicated in table below, record corresponding measured volt and current
- Calculate resistance using ohms law

Measurements

V source	V1 measured	V2 measured	I1 measured	I1 measured	R1 calculated	R2 calculated	Req calculated
2							
4							
6							
8							
10							
12							

	Average Calculated	Theoretical (as typed on component)	Deviation
R1			
R2			
Req			

Note that Deviation % = 100 * (measured- Theoretical)/ Theoretical

Experiment (4.2)
Parallel connection of Ohmic resistors

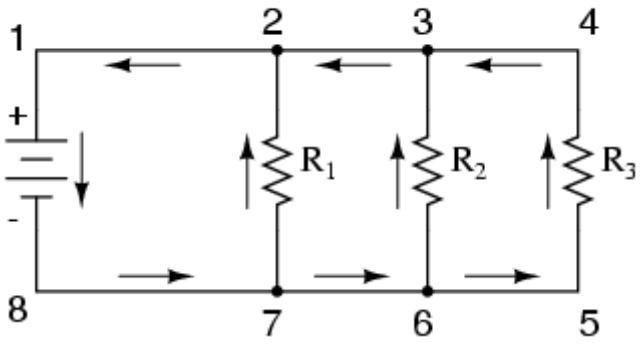
Objective

- To examine the series connection of parallel resistors, calculating the equivalent resistance using ohm's law

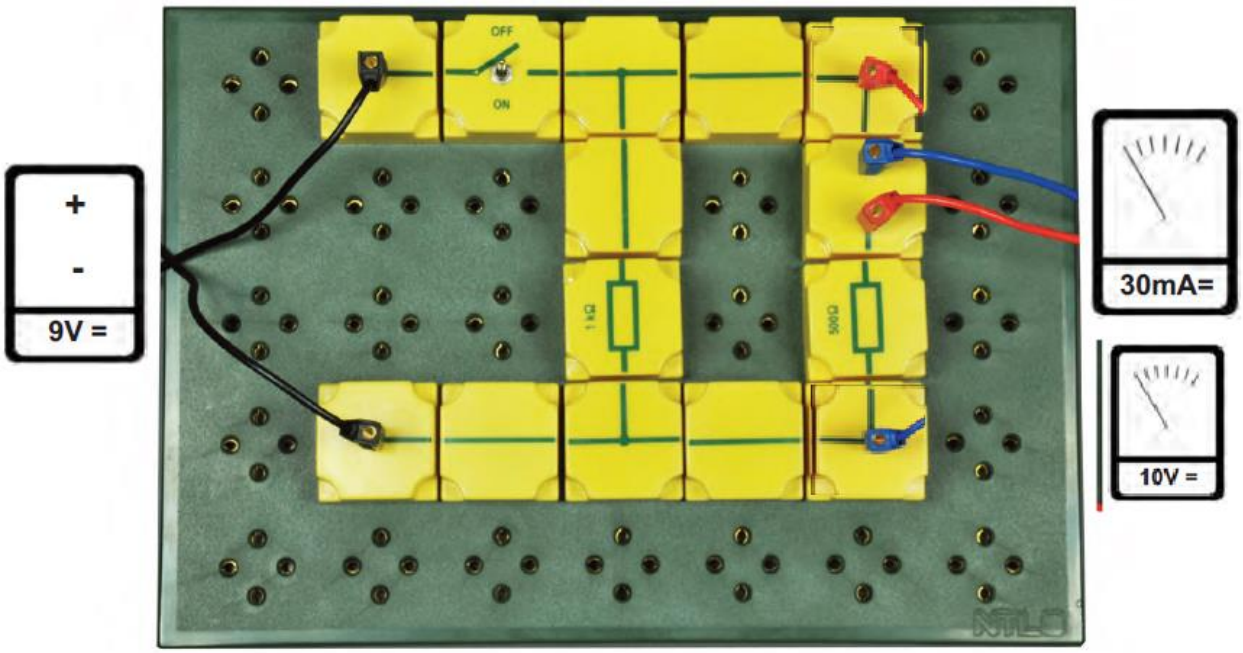
Theory

- A parallel circuit is defined by the fact that all components share two common nodes.
- The voltage is the same across all components and will equal the applied source voltage.
- The total supplied current may be found by dividing the voltage source by the equivalent parallel resistance. It may also be found by summing the currents in all of the branches.
- The current through any resistor branch may be found by dividing the source voltage by the resistor value.
- Consequently, the currents in a parallel circuit are inversely proportional to the associated resistances.
- . For a two resistor circuit this states that the current through one resistor is equal to the total current times the ratio of the other resistor to the total resistance.

Parallel



Procedure



- Arrange connections as shown above
- Apply voltage as indicated in table below, record corresponding measured volt and current
- Calculate resistance using ohms law

Measurements

V source	V1 measured	V2 measured	I1 measured	I1 measured	R1 calculated	R2 calculated	Req calculated
2							
4							
6							
8							
10							
12							

	Average Calculated	Theoretical (as typed on component)	Deviation
R1			
R2			
Req			

Note that Deviation % = 100 * (measured- Theoretical)/ Theoretical

Conclusions

- Regarding experiment 4.1, how to calculate the equivalent resistance of two series resistors?

- Regarding experiment 4.2, how to calculate the equivalent resistance of two parallel resistors?

- Regarding the series/parallel connection of loads, if the source voltage is constant. Dose it effect the dissipated power by load?
- Proof that by calculations considering 220 volt supply and two lamps of 800 ohm?