

Lab Report number 1
Resistance and Current Measurement

ENS203 – Electrical Circuits I

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ENS203 - ELECTRICAL CIRCUITS I

Lab Report number I - Getting on board

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1 Introduction

1.1 Background

Get introduced to the laboratory equipment and learn how to measure resistance, voltage and current safely. Learn how to use breadboard to connect components together in series, parallel and mixed configurations. Learn how to use a multimeter to measure resistance, voltage and current.

1.2 Objective

- Switch in DC power supply, and fix it to 5 V, then measure the 5 V using the multi-meter
- When done switch off.
- Switch on function generator, and fix it to produce sin wave with 100 Hz, show the signal on a oscilloscope
- Switch off
- Pick up two unknown resistors, measure them using the multi – meter
- Connect them on bread board in series
- Connect them on the bread board in parallel
- Use more resistors and connect the following circuit on the bread board.

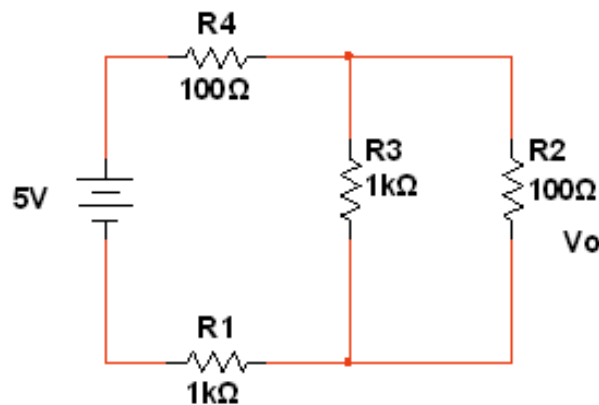


Figure 1: Circuit to be connected on the bread board

2 Methods

2.1 Apparatus

Breadboard also known as protoboard is a type of solderless electronic circuit board, where you can build electronic circuits without any soldering. Its advantages that it is reusable and the circuits are easy to modify and rebuild. Figure 2 shows a part of a breadboard and how the pins are connected, although there are many types of breadboards, the principle is the same.

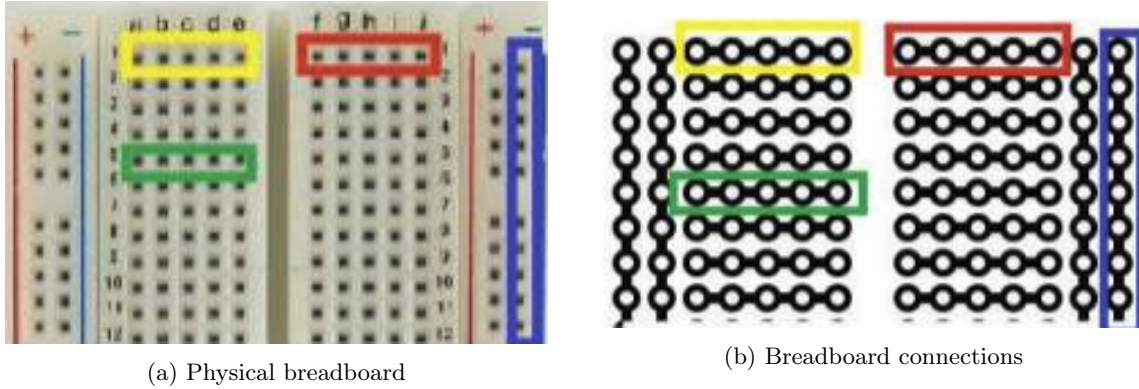


Figure 2: Breadboard and its connections

Every 5 holes in horizontal direction, which are marked with letters a,b,c,d,e or f,g,h,i,j represent a one connection point. When we want to connect circuit elements we connect one terminal of each element in one of the 5 holes, and we connect another element's terminal into another hole of the 5 to have two elements connected at one point.

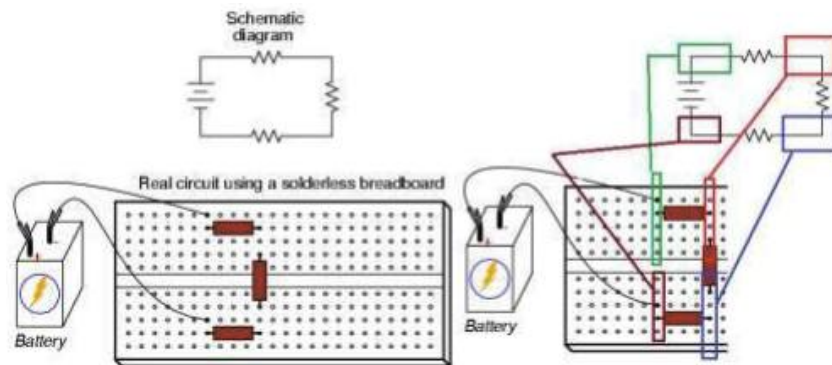


Figure 3: Scheme diagram on a breadboard

Multi-meter used to measure electrical quantities



Figure 4: Multi-meters

DC power supply used to provide a constant voltage

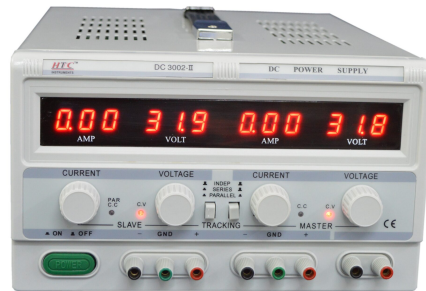


Figure 5: DC power supply

Function generator used to produce a signal

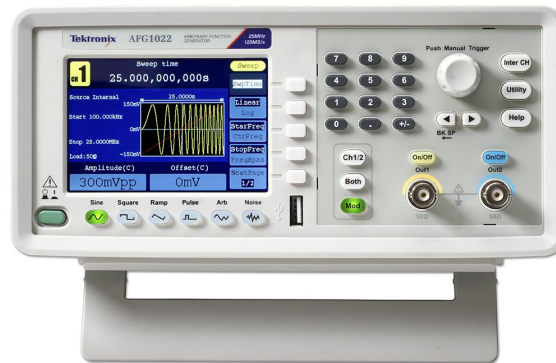


Figure 6: Function generator

Oscilloscope used to show an signal

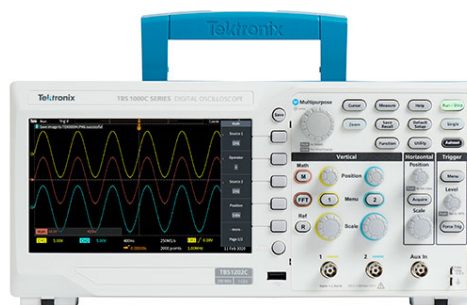


Figure 7: Oscilloscope

Probes used to measure voltage



Figure 8: Probes

Resistors are used to control the current flow in circuits, they are mainly made of compost materials and their values which are given in Ohms can be found from color code (bands) on the resistor or by measuring the value of the resistance using Ohm-meter. Resistors and color code are shown in Figure 9.

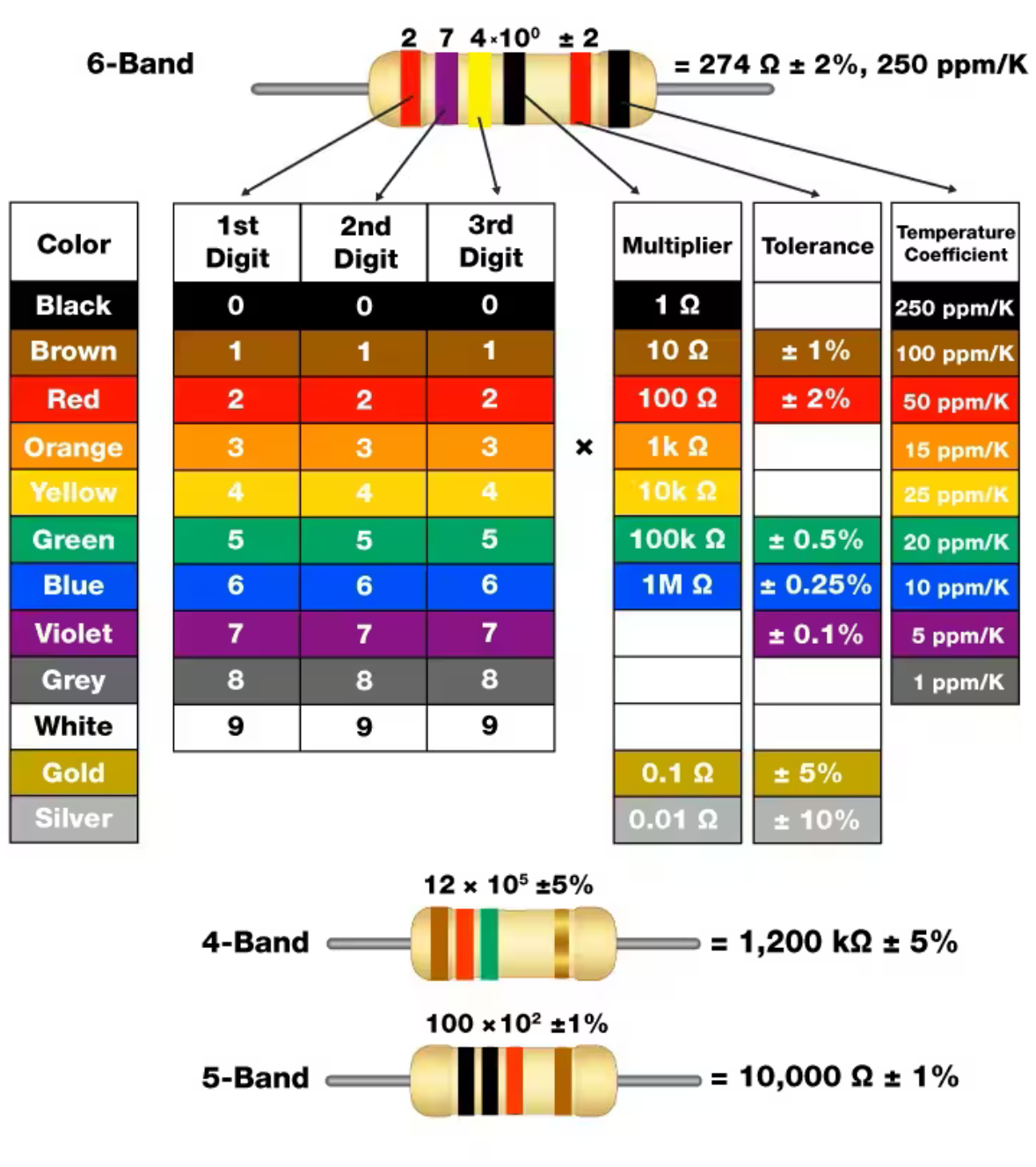


Figure 9: Resistor color code table