

ELECTENG209
Team 02:
Project Component Values

Ankush Patel, Daniel Lin, Krithik Lakinwala, Rukin Swedlund

13/08/2020

Contents

1	Introduction	3
2	Voltage & Current Sensors	4
3	The E-12 Series:	6

1 Introduction

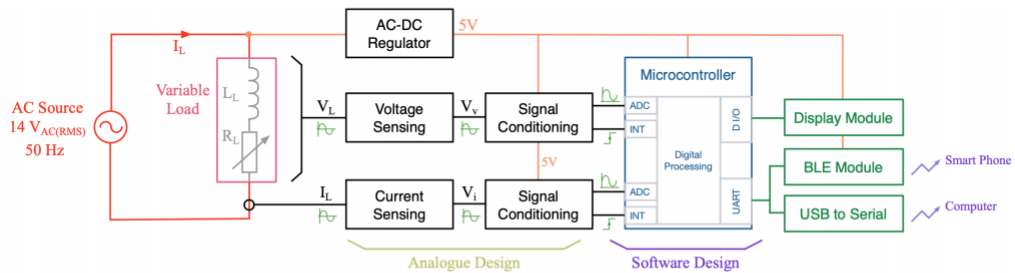
This document details the circuits and component values we will use to build our project. The structure and order of the component values and circuits described follow the order of the Labs.

The basic structure of components is as follows:

System to Implement

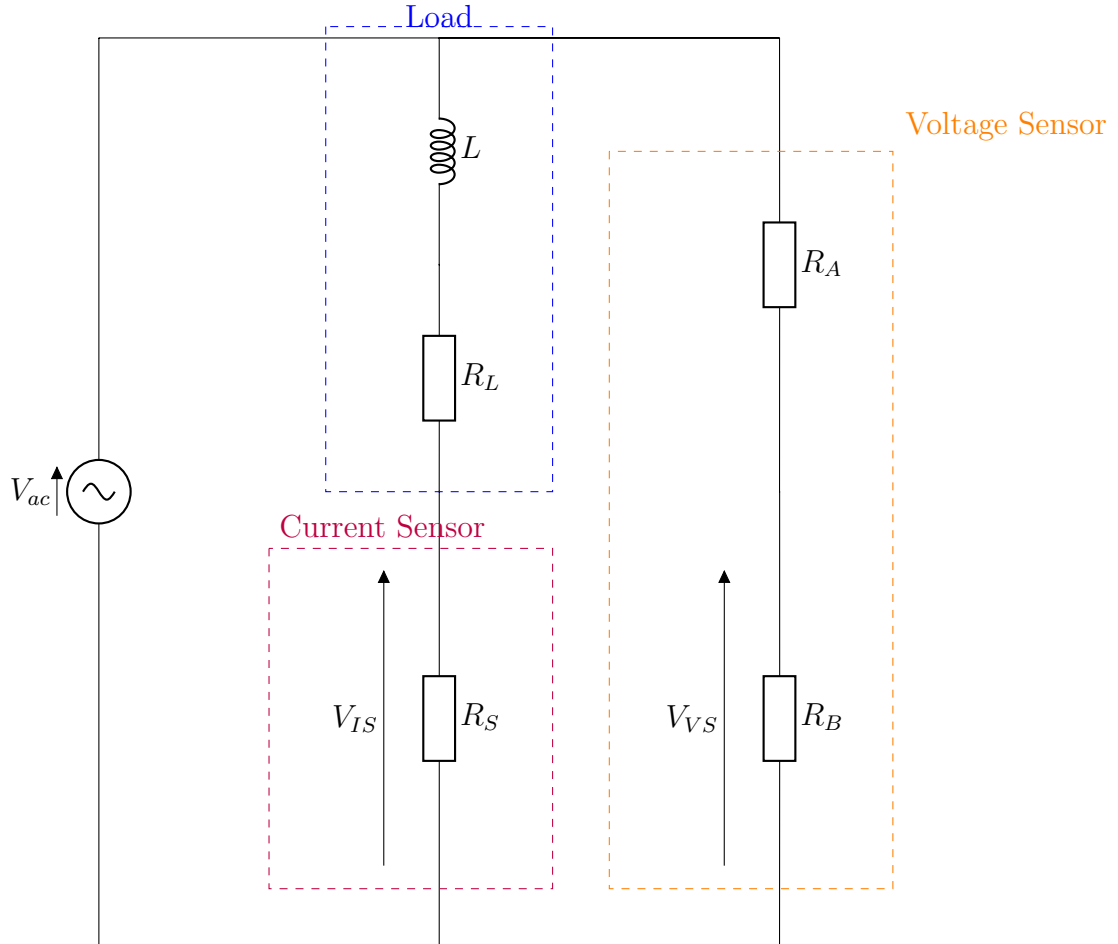


- To simplify the design, we will consider a scaled-down system, which uses a low-voltage AC source
 - An AC load, consisting of a variable resistor in series with a fixed inductor, is used to emulate an house-hold appliance



All (fixed) component values are based on the The E-12 Series

2 Voltage & Current Sensors



R_S is the Shunt Resistor that we use to measure the current drawn through the load.

V_{IS} is the voltage dropped across the shunt resistor (R_S). This drop in voltage is proportional to the current through the shunt resistor (and therefore proportional to the current through the load).

The nominated value of R_S is $R_S = 0.56 \Omega$.

R_A and R_B are the two Voltage Dividers that make up the voltage sensor. The Voltage sensors output is taken to be the voltage across R_B (V_{VS}).

The nominated values for R_A and R_B are: $R_A = 82 \text{ k}\Omega$ and $R_B = 3.8 \text{ k}\Omega$.

The following is a table of values to use for testing the limits of the sensors:

Source V_{AC}	$V_{AC(RMS)}$	R_L
7.5 VA	12.6 V	16.65 Ω
7.5 VA	15.4 V	29.00 Ω
2.5 VA	15.4 V	92.82 Ω

3 The E-12 Series:

1.0 Ω 1.2 Ω 1.5 Ω 1.8 Ω 2.2 Ω 2.7 Ω
3.3 Ω 3.9 Ω 4.7 Ω 5.6 Ω 6.8 Ω 8.2 Ω 10.0 Ω

(Multiplied by any power of ten).