

UNIVERSITI TEKNOLOGI MARA

**THREE IN ONE MEASUREMENT
TOOL FOR VOLTAGE, CURRENT
AND SPEED**

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ABSTRACT

The goal of this project is to address the limitations of existing measurement tools using microcontrollers by developing a multi measurement tool using Arduino as the microcontroller. The tool will combine the capabilities of a voltmeter and ammeter into a single device, providing users with a more efficient and user-friendly solution. Additionally, a speed sensor will be integrated into the tool, enabling the measurement of speed in electrical appliances such as induction motors and DC motors. By combining multiple measurement features into one device, the project seeks to create a versatile three-in-one tool for electrical measurements. A successful implementation of the voltage sensor, current sensor, and speed sensor is what is expected from this project, with the Arduino UNO serving as the system's primary controller. Overall, the project aims to achieve its objectives and provide a comprehensive solution for electrical measurement needs.

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CHAPTER ONE

INTRODUCTION

1.1 Project Overview

Measurement tools are essential for electricians as they enable accurate voltage and current measurement. These instruments have undergone a revolutionary change thanks to microcontrollers, whose precise algorithms and user-friendly features offer a number of benefits. With open-source code readily available, engineers and enthusiasts can create their own measurement tools, such as voltmeters, ammeters, and even tachometers for speed measurement. The lives of experts who work with computations and measurements have been greatly simplified by these instruments.

Nevertheless, despite the benefits provided by microcontroller-based measurement instruments, a few issues need to be resolved. First off, users who need numerous measuring capabilities are burdened by the prevalence of single-function measurement equipment. This calls for the development of numerous tools, each of which makes use of a microcontroller. Second, while speed measuring is essential for some electrical devices, such as DC motors or induction motors, standard multimeters do not include it.

To overcome these challenges, this project aims to develop a multi-measurement tool using Arduino as the microcontroller. It becomes a versatile tool for monitoring voltage, current, and speed in electrical appliances by incorporating a voltmeter, ammeter, and speed sensor into one instrument. The goal of this project is to create a well-functioning instrument with sensors for voltage, current, and speed that can accurately measure their respective values. A seamless integration of input and output is made possible by the Arduino UNO, which serves as the system's main microcontroller. In the end, if the project's goals are accomplished, it will produce a thorough, three-in-one measurement tool for electrical applications.