UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT FOR LOAD BOARD CHECKER USING ARDUINO

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer System) with Honours.

by

NURUL SYAHIRAH BINTI AB HALIM

B071710101

950107-14-5728

FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING

TECHNOLOGY

2020

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

Tajuk: Development For Load Board Checker Using Arduino

Sesi Pengajian: 2020

Saya **Nurul Syahirah Binti Ab Halim** mengaku membenarkan Laporan PSM ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka (UTeM) dengan syarat-syarat kegunaan seperti berikut:

1. Laporan PSM adalah hak milik Universiti Teknikal Malaysia Melaka dan penulis.
2. Perpustakaan Universiti Teknikal Malaysia Melaka dibenarkan membuat salinan untuk tujuan pengajian sahaja dengan izin penulis.
3. Perpustakaan dibenarkan membuat salinan laporan PSM ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. **Sila tandakan (X)

☐	SULIT*	Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia sebagaimana yang termaktub dalam AKTA RAHSIA RASMI 1972.

☐ TERHAD* Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan.

☒ TIDAK TERHAD

Yang benar,

.....

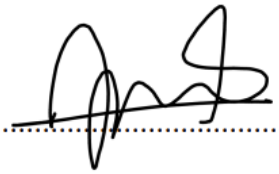
Nurul Syahirah Binti Ab Halim

Alamat Tetap:

No 3567 Jalan Anggerik,
Taman Muhibbah,
73200 Gemencheh,
Negeri Sembilan.

Tarikh: 14/2/2021

Disahkan oleh penyelia:



.....

Pn Nurliyana Binti Abdul Mutalib

Cop Rasmi Penyelia

NURLIYANA BINTI ABD MUTALIB
Pensyarah
Jabatan Teknologi Kejuruteraan Elektronik dan Komputer
Fakulti Teknologi Kejuruteraan Elektrik Dan Elektronik
Universiti Teknikal Malaysia Melaka

Tarikh: 18/2/2021

*Jika Laporan PSM ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan PSM ini

DECLARATION

I hereby, declared this report entitled Development For Load Board Checker Using Arduino is the results of my own research except as cited in references.

Signature: ……

Author : Nurul Syahirah Binti Ab Halim

Date: 14/2/2021

APPROVAL

This report is submitted to the Faculty of Electrical and Electronic Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Computer Engineering Technology (Computer System) with Honours. The member of the supervisory is as follow:

Signature : .....

Supervisor : Pn Nurliyana Binti Abdul Mutalib

ABSTRACT

The development for load board checker is industries project mainly designed for final test engineer in Testhub Sdn Bhd. This company have been troublesome to find the error whether the condition of the components is good or not. For a few years, they use old method where the engineer must fine and measured manually the load board that have been rejected at final test. There have many parts on the load board. It takes a few times and less the production every day. This project help the engineer find the problem and measured the components automatically.

ABSTRAK

Pembuatan untuk pemeriksaan papan utama litar adalah projek inudstri reka bentuk utama untuk jurutera bahagian pemeriksa terakhir di Testhub Sdn Bhd. Syarikat ini mempunyai masalah untuk mencari kesilapan yang mana litar terbuka atau litar pintas dalam masa yang singkat. Beberapa tahun sebelum, mereka telah menggunakan cara yang lama dimana jurutera perlu mencari dan mengukur secara manual pada papan utama litar yang telah di toklak dari pemeriksaan terakhir. Terdapat banyak bahagian dalam setiap papan utama litar. ia memerlukan masa dan akan mengurang kan pengeluaran produk setiap hari. Sistem ini akan mencari julat bagi setiap komponen mengikut julat yang diberi.

DEDICATION

To my lovely parents

En. Aziman Bin Ahmad and Pn. Ramlah Binti Sulaiman

My talented supervisor

Pn. Nurliyana Binti Abd Mutalib

and

My beloved siblings

ACKNOWLEDGEMENTS

I might to offer my gratitude to individuals and organization for supporting me throughout my studied. For instance, I want to show my sincere thanks for the enthusiasm, patience, informative suggestions and helpful knowledge to my supervisor, Pn Nurliyana Binti Abd Mutalib. I have been doing in research and writing with the great ideas from my talented supervisor. I am able to complete this project due to my tremendous knowledge and technical skills applying. This project is not working without her assistance and guidance. I additional wish to communicate my earnest gratitude thanks to Universiti Teknikal Malaysia for accepting me graduate program. Last but not least, special thanks to my lovely parents that have been given their encouragement and support through financial.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Background

1.1.1 Load Board

Load board is custom printed circuit board (PCB) that acts as a mechanical and electronic interface between the tester and device under test. Other name of load board is mainboard where load board is the one essential part of technology such as computer system, smart phone, printer and so on.

There are certainly a lot of acronyms on every load board. To understand how every technologies work, the user doesn't need to know every single part of the load board. However, it is good to know some of the important parts and how the load board connect the various parts. They have seen the one piece of equipment that ties everything together. A load board allows all the parts to receive power and communicate with one another. If one of the components is not function, the entire of the load board is not working.

1.1.2 Components Electronic

Electric components used for microcomputers which are small little PCs used to control a large number of gadgets. There have a few components among the most

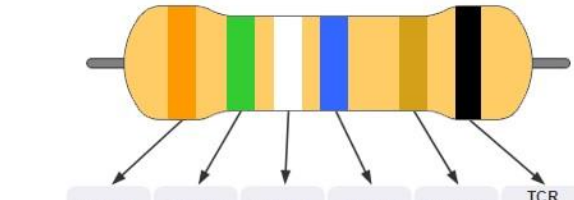
common found in electronic devices. Firstly, Batteries used to convert substance energy to electrical energy. The two distinct cells of a battery are anode (+) and cathode (+).
In additional, load board also have a few components that have active and passive components. Active components are parts of circuit that depend on an outside control source to control or alter electrical signals. For example transistor used electricity to control power. While passive components are used a few other property to control the electrical signal. For example, passive components like resistor, transformer and diode do not require an outside control source to operate.

Resistor is important to reduce current flow, alter signal and gap the voltage. The proportion is spoken to by Ohm's law R=V/I where R is resistor, V is voltage and I is current flow. There are two main circuit symbols used for resistor. In figure 1.1, there are example of resistor's symbol.

Figure 1.1: Symbols of resistor.

There are more than one different type of resistor. The basic role is to constrain and confine the progression of electrical. In this manner, the main parameter is the resistance value. The building accuracy if this worth is demonstrated with the resistor tolerance in percentage. Some are special applications like being used as variables resistors and others used for surge limitation whilst others provide a variable resistance with temperature. With several colours band around the component body, the resistance

value and tolerance are indicated. There are four colours band in a few resistors to classification their resistance value. Two first band determine the significant digits value of resistance, while multiplying factor and the fourth band gives the tolerance is the third band. Every colour represented a different number. Figure 1.2 show example of resistor colour code chart.



	1st digit	2nd digit	3rd digit	multiply	tolerance	TCR (ppm/K)
Black	0	0	0	1	1% (F)	100
Brown	1	1	1	10	2% (G)	50
Red	2	2	2	100		15
Orange	3	3	3	1K		25
Yellow	4	4	4	10K		
Green	5	5	5	100K	0.5% (D)	
Blue	6	6	6	1M	0.25% (C)	10
Violet	7	7	7	10M	0.1% (B)	5
Gray	8	8	8	100M	0.05% (A)	
White	9	9	9	1G		
Gold				0.1	5% (J)	
Silver				0.01	10% (K)	
None					20% (M)	

Figure 1.2: Colour code chart.

A capacitor as a passive electronic components is a product in an electric field that stores electrical energy. There have thre types of capacitor that is fixed capacitor, polarized capacitor and variable capacitor. A fixed capacitor is a type of capacitor that provides a fixed amount of capacitance. In other terms, a fixed capacitor is a form of capacitor which stores a fixed amount of electric charge that can not be modified. Fixed capacitor are categorized according to the dielectric material used to build the into different forms. The one that have unique positive and negative polarities are polarized capacitor. Polarized capacitor always be taken care, when using these capacitors in cicuit

that they are attached in perfect polarities. There have two types of polarized capacitor that is electronic capacitor and super capacitor. In general, variable capacitors consist of interwoven metallic plate sets in which one is fixed and the other is variable. Tuning capacitors and trimmer capacitors are the primary types of variable capacitors.

Figure 1.3: Symbol of Capacitor

1.2 Problem Statement

In every company produce load board product have been troublesome to find the error such as damage part using manual method. In the final test, some of load board will get error and the error is too general. To find the error on the load board will take a few times using manual method which is the engineer must measure every part on the load board one by one.

In addition, if it takes more time, it also takes more cost to cover the reject load board. It will affect production output. Using manual method, it will cause a damage for the part in load board. It also can affect a scratch to the PCB and also cause the damage to the board.

1.3 Objectives

After studying the above problem statement, the key objectives of the lead of PSM are:

i. To study manual method used to check load board.

ii. To develop a load board checker for display.

iii. To monitor the accuracy of component.

1.4 Scope

The extent of this project is fundamentally introducing system for load board checker. This project is invented for daily usage of industries who produce using load board. This system corresponding for final test engineer for testing the load board either the board fail or pass. This system will give the value of each components without measure it manually.

1.5 Summary

This project focuses on system for load board checker. This report have five chapter initially brief a introduction about the issue from company. There also have objective and scope in chapter one. At the point, chapter two have literature reviews of existing steps progress and different advances that have been implemented in the past. Comparison of advantages and disadvantages will be briefly discussed in chapter two. Next, an overview of the software and methods want to use will be explained in chapter three. The results information of the result, including data tabulation and project analysis, will then be discussed in chapter four. Last but not least, the conclusion and future suggestion will be highlight in chapter five.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This part talks about on the writing survey of the past project and papers that are identified with this undertaking. This chapter also discuss the details of the whole system from beginning until end and flow of steps involved in development for load board checker. There are a few platforms to create this project using a few microcontrollers such as PIC, Arduino Uno, Raspberry Pi and others.

2.2 Related Previous Works

2.2.1 "Component Tester - Test Almost Anything" by Baweja Akshay (2015).

This project created by Bawaje Akshay in 2020 to test the electronic component. Come up with components tester so that all components can be tested. Besides that, this project obviously not tested for the power components because needed more power and current for AVR microcontroller could not acemmodate. This project is able to measure up to 50V voltage and also test frequency counter with frequency generatorator. It used a freeware version of Eagle software to build PCBs. In the tester menu, which includes PWN Generation, Square Wave

Generation, Frequency Counter, IR Code Detector, Calibration and Modification Menu, after the tester is turned on, turn the rotary encoder left.

This project come up with components tester so that all components can be tested. It used AVR microcontroller

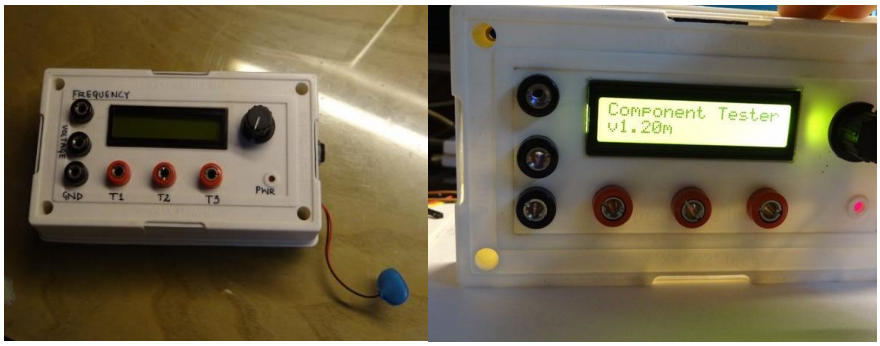


Figure 2.1: Component Tester

2.2.2 "Digital IC Tester using Arduino" by Prof. D. G. Kanadeet al. (2019)

The Digital IC Tester is a circuit based on a microcontroller that measures the IC's weather in good or poor working condition. In industries, quality testing is a significant, costly and time-consuming procedure. The Arduino board was an open source microcontroller board, based on the Atmega 2560 microcontroller. This board's production environment handles the sorting. Through their basic platform, these boards had recharged the automation industry to be used everywhere someone with small size otherwise no technical expertise could begin by exploring the requisite programming skills and running the Arduino board. This panels were used to extend multiple virtual