

PORTABLE ID DETECTION READER WITH PC SYNCHRONIZATION

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ABSTRACT

This project will develop as attendance device which will be used by lecturer to take attendance of their students in the university. Students must touch their ID card to the Portable ID detection reader before start the class. After class, the lecturer will transfer all of the data from Portable ID detection reader to the computer through USB port. Besides, LED indicators are use for a signal such as, when student touch their ID card, when the battery is low, and when the buffer are full. Besides, this project uses hardware and software programming with PIC 16F648A using MPLAB IDE 8.10 and Oshon PIC simulator to simulate the program and also Graphic User Interface (GUI) for database to transfer all the data.

ABSTRAK

Projek ini direkapi untuk memudahkan pensyarah mengambil kehadiran pelajar-pelajar di IPT. Dengan hanya menyentuh kad ID para pelajar pada pengesanan alat pembaca iaitu '*Portable ID*', ia akan membaca data-data pelajar yang diambil dengan secepat mungkin. Pelajar-pelajar hendaklah menyentuh kad ID mereka setiap kali sebelum kelas bermula. Ini kerana ia akan memudahkan pensyarah untuk memindahkan data-data tersebut daripada '*Portable ID*' ke dalam komputer. Semua data-data tersebut dipindahkan dengan menggunakan port USB. Penggunaan LED juga digunakan dalam sistem ini iaitu akan memberi signal setiap kali para pelajar menyentuh kad ID mereka atau apabila bateri menjadi lemah atau kandungan data dalam '*Portable ID*' menjadi penuh. Selain itu, projek ini juga menggunakan mikropengawal iaitu PIC16F648A untuk mengawal semua sistem dan penggunaan program MPLAB IDE 8.10 dan Oshon PIC Simulator untuk simulasi program tersebut dan GUI digunakan untuk memindahkan semua data-data ke dalam sistem.

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LIST OF ABBREVIATION

ISO	-	International Organization for Standardization
PC	-	Personal Computer
USB	-	Universal Serial Bus
MEMR	-	Memory Ethernet MIFARE Reader
GUI	-	Graphical User Interface
RAM	-	Random Access memory
IDE	-	Integrated Development Environment

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CHAPTER I

INTRODUCTION

This chapter covers introduction to PSM project. To outline the chapter, we will first discuss the background of the project. It is followed by the problem that is trying to be solved. Next the objectives will be presented. The remaining sections describe the work scope, short explanation on project methodology and the structure of this report.

1.1 Background

Usually, the attendances of the students in educational institution are taken by pen and paper. Perhaps, by using this new Portable ID detection reader system, it makes work become convenient for lecturer to take the attendance of the students. This project uses a system that is capable to record the student's attendance using interactive input, generating the reports, reviewing the student's ID, date and time.

Upon testing, this Portable ID detection reader system, it can evaluate up to 4000 student's ID card for limited data storage inside its RAM. This means, this project can regenerate a framework for future implementation for student's attendance system and a technology-based solution to support the student tracking process.

1.2 Objectives

The aim of the designing, developing and constructing the circuit is to fulfilled several objectives that need to be achieved. Nowadays, technology is very important to us. Day by day, there a lot of something new and useful has been created. So, this project can be assumed as a contribution to the technology if it can be done successfully.

There are several objectives established to be achieved so that this project is finished successful. Below are the objectives of this project:-

- 1) To design and develop the detection ID card with the attendance application.
- 2) To develop a system that synchronized attendance report and data to PC.
- 3) To develop a system with a small size that can be handy to carry along because of its size.

1.3 Problem Statement

Nowadays, the attendance of student is very important part in every subject as it is required in the ISO procedures.

Furthermore, lecturers cannot handle a big group of student in the class to monitor the student attendance. Most of the students will ask their friends to sign their attendance and lecturers are not aware of this due to a big group of student in the class.

To overcome this problem, ID detection is viable solution as the student needs to personally touch their ID card to record the attendance. With this portable ID detection reader, it can axis lectures to take attendance and to synchronize the record back to PC. The mobile reader also portable because of its small size and the data can be transferred to PC using RS232 to USB converter.

1.4 Scope

This project will discover certain area of development which stated in the scopes below:

- 1) To develop a system using PIC 16F648A to control all the operations from receiving data from MIFARE reader and transferred the data to PC using RS232 to USB converter.
- 2) Data will read the ID card of student and time attendance.
- 3) System compatible with UTeM student ID card.

1.5 Report Structure

This report contains of five chapters that explain detail about this project. The first chapter is introduction of the project. This chapter contain of project introduction, project objectives, project scope, problem statement and research methodology.

The second chapter is literature review about MIFARE card and MIFARE Reader. The project will be explained briefly in this chapter. It also includes the advantages and disadvantages using my way or method. So, it is very important to understand the concepts involve and how this system works.

The third chapter is about the components used in this project. This chapter gives information about hardware and software involves in order making this project works. These chapters also give information about a circuit and the main components used. The components are PIC 16F648A, 24LC512, PCL7673, PCF 8563 and WDT 705 and many more.

The fourth chapter is Project Methodology. This chapter will figure out a few tests that have been conducted. This is to make sure the components and other devices involves are in good condition function. The testing procedures, devices and method used to generate the expected results will include in this chapter. It also consist the detail development of GUI using Visual Basic software and process transfer data from the Memory Ethernet MIFARE Reader (MEMR) to Personal Computer using RS232 USB converter.

The fifth chapter is result of ID Detection Reader with PC Synchronization. This chapter consists of an outcome for this project. It shows results, possible problems and solution for the problems occurred.

The last chapter is about project application of the project, discussion and conclusion of the project. This chapter also contain of suggestion to improve this project for future works. The overall conclusion of this project showed.

CHAPTER II

LITERATURE REVIEW

In short, this chapter discusses the research findings of literature reviews from past researches. It discusses the Memory Ethernet MIFARE Reader (MEMR), MIFARE Card Reader, Microsoft Visual Basic Software, MPLAB 8.0 Software, PIC Simulator IDE and others along with the important mechanisms that are used to build a control system for an attendance system. This chapter will also include the research findings from reading, observing and information seeking to further the knowledge about the tools being used. This is to give a clear view on the project.

2.1 Memory Ethernet MIFARE Reader (MEMR)

Memory Ethernet MIFARE Reader (MEMR) is a reader that operates through Ethernet environment or network. MEMR board is installed together with the RAM. Its functions as a time attendance and all of the data can be save when the power or system is down. So, it can save all the data when the power or system is down. When the reader read the data from the smart card, it will be transferred to RAM in MEMR board. Then, the data is transferred to the Ethernet module.

2.2 MIFARE Card Reader

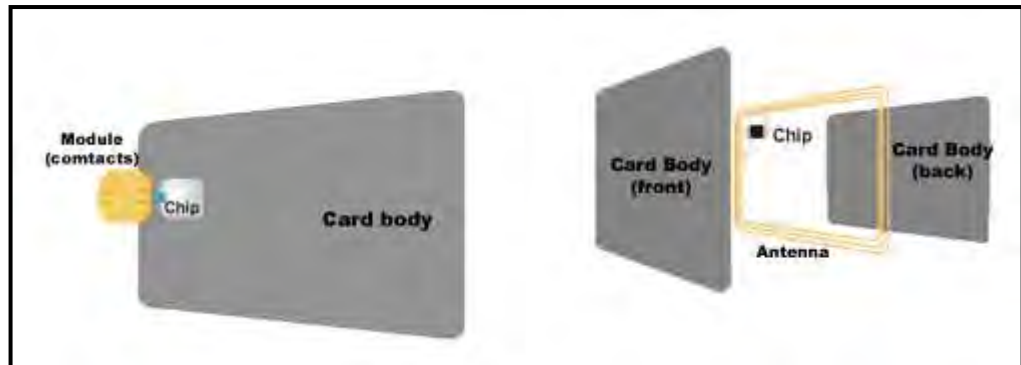


Figure 2.1 MIFARE Card readers

MIFARE MF1 IC S50 reader installs in contactless smart cards according to ISO/IEC 14443A provided by PHILIPS Semiconductors. The communication layer (MIFARE RF Interface) complies with parts 2 and 3 of the ISO/IEC 14443A standard. The security later supports the field-proven CRYPTO1 stream cipher for secure data exchange of the MIFARE classic family [5]. The reader must be registered first. MIFARE reader has a unique identity such as:-

2.2.1 Contactless Energy and Data Transfer

In the MIFARE system the MF1 IC S50 is connected to a coil with a few turns and then embedded in plastic to form passive contactless smart card. No battery is needed. When the card is positioned in the proximity of the Read Write Device (RWD) antenna, the high speed RF communication interface allows to transmit data with 106 kBit/s.

2.2.2 Anticollision

An intelligent anticollision function allows operating more than one card in the field simultaneously. The anticollision algorithm selects each card individually and ensures that the execution of a transaction with a selected card is performed correctly without data corruption resulting from other cards in field.

2.2.3 User Convenience

The MIFARE system is designed for optional user convenience. The high data transmission rate for example allows complete ticketing transactions to be handled in less than 100 ms. Thus the MIAFRE card user is not forced to stop at the RWD antenna leading to a high throughput at gates and reduced boarding times onto busses

2.2.4 Security

Special emphasis has been placed on security against fraud. Mutual challenge and response authentication, data ciphering and message authentication checks protect the system from any kind of tampering and thus make it attractive for ticketing applications. Serial numbers, which cannot be altered, guarantee the uniqueness of each card.

2.2.5 Multi-application Functionality

The MIFARE system offers real multi-application functionality comparable to the features of a processor card. Two different keys for each sector support systems using key hierarchies.