

PC-BASED TOKEN DISPLAY WITH REMOTE FUNCTION

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This report is submitted in partial fulfillment of the requirements for the award of
Bachelor of Electronic Engineering (Computer Engineering) With Honours.

Faculty of Electronic and Computer Engineering
Universiti Teknikal Malaysia Melaka

April 2009



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FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

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Special dedication to my beloved father and my late mother, my family and my kind hearted supervisor Mrs. Siti Huzaimah Bt Husin, and my dearest friends.

ACKNOWLEDGMENT

With the name of Allah, The most Gracious and Merciful. Praise to Allah Almighty for giving me the will and strength to complete this thesis project successfully.

First and foremost, I would like to express my deepest gratitude and appreciation to my respected supervisor, Mrs. Siti Huzaimah Bt Husin for her guidance, advices, supervision and encouragement in supervise me to complete the project within the time given. The valuable and useful ideas that she had shared with me in finishing the project is very much appreciated. Thanks also for spending her precious time and efforts in evaluating my work.

Special thanks also to my beloved father, family members and friends for their help, supports and invaluable assistances towards this thesis project. Lastly, I would like to convey my gratitude to other people who directly or indirectly help me in the process of finishing this thesis project.

ABSTRACT

This report describes the design of PC-based token display with remote function system. This system informs the people about the token number of something. This system consists of two portions: transmitter and receiver unit. The receiver unit will be control by remote control using infrared technology as a transmitter and also can be controlled by computer terminal. The software and hardware design in both units will be accomplished using PIC (Peripheral Interface Controller) microcontroller. The information which is set with the control unit is displayed on the 7-segment LED (Light Emitting Diode) display. The process programming for both units are developed and written in PIC (Peripheral Interface Controller) assembly language. This paper describes the design and project operation. The main characteristic of this project are infrared communication technology, microcontroller and PC-based using GUI (Graphical User Interface) design by Visual Studio 2005 software.

ABSTRAK

Laporan ini menerangkan proses merekebentuk sistem Paparan Token berasaskan PC dengan fungsi alat kawalan jauh. Sistem ini memberi paparan angka giliran atau sebagainya kepada orang ramai. Sistem ini terbahagi kepada dua bahagian: pemancar dan penerima. Unit penerima akan dikawal oleh alat kawalan jauh yang menggunakan teknologi cahaya infra merah yang bertindak sebagai pemancar dan juga akan dikawal melalui terminal komputer. Perisian dan perkakasan dikedua-dua unit akan dihubungkan dengan menggunakan PIC (Pengawal Sampukan Boleh Aturcara) mikro-pengawal. Maklumat yang disetkan pada unit pengawal akan dipaparkan di paparan tujuh segmen LED (Diod Pemancar Cahaya). Proses memprogramkan untuk kedua-dua unit dibangunkan dan di tulis dalam bahasa pengaturcaraan PIC (Pengawal Sampukan Boleh Aturcara). Kertas ini menerangkan rekabentuk dan operasi projek. Ciri utama projek ini adalah teknologi komunikasi cahaya infra merah, mikro-pengawal dan PC berasaskan rekabentuk GUI (Muka Pengguna Grafik) oleh perisian *Visual Studio 2005*.

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LIST OF ABBREVIATIONS

PIC	-	Peripheral Interface Controller
GUI	-	Graphical User Interface
LED	-	Light Emitting Diode
I/O	-	Input/Output
IR	-	Infrared
RF	-	Radio Frequency
DIN	-	Deutsches Institut für Normung
NIR	-	Near Infrared
SWIR	-	Short-wavelength Infrared
MWIR	-	Mid-wavelength Infrared
LWIR	-	Long-wavelength Infrared
IIR	-	Intermediate Infrared
FLIR	-	Forward-looking Infrared
FIR	-	Far Infrared
CIR	-	Consumer Infrared
IREDD	-	Infrared Emitter Diode
IrDA	-	Infrared Data Association
FCC	-	Federal Communications Commission
CPU	-	Central Processing Unit
ROM	-	Read Only Memory
RAM	-	Random Access Memory
EEPROM	-	Electrically Erasable Programmable Read Only Memory
D/A	-	Digital/Analog

A/D	-	Analog/Digital
CMOS	-	Complementary Metal Oxide Semiconductor
ICD	-	In-Circuit Debugger
USART	-	Universal Synchronous Asynchronous Receiver Transmitter
PWM	-	Pulse Width Modulation
SPI	-	Serial Peripheral Interface
SCI	-	Serial Communication Interface
RISC	-	Reduce Instruction Set Computer
SRAM	-	Static Random Access Memory
RC	-	Resistor Capacitor
PSP	-	Parallel Slave Port
VREF	-	Voltage Reference
LCD	-	Liquid Crystal Display
PCB	-	Printed Circuit Board
CLR	-	Common Language Runtime
BCD	-	Binary Code Decimal

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CHAPTER 1

INTRODUCTION

1.1 Project Synopsis

PC-Based Token Display with Remote Function is a suggestion project that used infrared technology to control the token display that usually used in bank, post office etc. This project is an enhancement for the conventional token display nowadays. Traditionally, the token display that used nowadays mostly is controlled by push button, keypad or switch. This method involved a cable installation that required high cost consumes. Besides, it will involve with complicated installation of cable to connect the button, software part and token display because of the distance. This project is specially design to reduce the using of cable. The remote control facility use to display the alphanumeric characters in the token display from some distance. This token display will use seven-segment LED (Light Emitting Diode) display.

This report describes the design of PC-based token display with remote function system. This system informs the people about the token number of something. This system consists of two portions: transmitter and receiver unit. The receiver unit will be controlled by remote control using infrared technology as a transmitter and also can be controlled by computer terminal. The software and hardware design in both units will be

accomplished using PIC (Peripheral Interface Controller) microcontroller. The information which is set with the control unit is displayed on the 7-segment LED display. The process programming for both units are developed and written in PIC assembly language. This paper describes the design and project operation. The main characteristic of this project are infrared communication technology, microcontroller and PC-based using GUI (Graphical User Interface) design by Visual Basic software.

1.2 Project Objectives

The main purpose of this project is to make an enhancement for the present token display system. The enhancement will involve the using of infrared communication technology as a remote control replaces the conventional token display system and also terminal computer to monitoring and controlling the system.

Otherwise, this project is to reduce the cost of installation and maintenance of present system, low cost and create a various design nowadays to compete with others technology.

1.3 Problems Statement

The present token display system uses a cable installation as a medium to connect the button and token display. The present system determined problems which are:-

1. The cable installation required high cost consumes to connect the button and display.
2. The cable installation is complicated due to distance of switch and display.
3. High cost consume in maintenance.

1.4 Scopes of Work

PC-Based Token Display with Remote Function project function based on several scopes of work. PC-Based Token Display with Remote Function is design for token display system at bank. Besides, the token display will use the infrared remote control to control the display; replaced the present system that use cable and switch connection to control the display. For the display, the token will use LED seven-segment display. The operation of the system will display both alphanumeric characters with 5 digits at a time. The alphabet characters will display for counter A to C and token number from 0000 to 9999. The token number will change by increasing the present number of token. Besides the remote control as a controller for the token, the computer terminal also functions to monitoring and controlling the token number. The token display will interface to the computer using serial input/output communication cable. GUI (*Graphical User Interface*) is design using Visual Basic.

1.5 Project Methodology

1.5.1 Literature Review

The project methodology firstly started with literate review. The information of token display is research. At the same time, the information of infrared, microcontroller, remote control and computer based system is research. All the related and relevant information about this project is recorded.

1.5.2 Programming

Do the software study used in this project. The software studies are based on programming of PIC and the design of GUI using Visual Studio. Then, the programming of PIC is done. The simulation is run to test PIC programming. Then, the GUI is design using Visual Studio.

1.5.3 Design Hardware

The design of hardware includes the design of token display circuit and remote control circuit. The design must meet the requirements and scopes of project. The circuit is simulated and analyzed.

1.5.4 Integrated Hardware and Software

The integration of hardware and software was made to complete token display system. The overall systems then troubleshoot to check the output so that it meets the expected result.

The overall methodology for this project was simplified as in Figure 1.1 below.

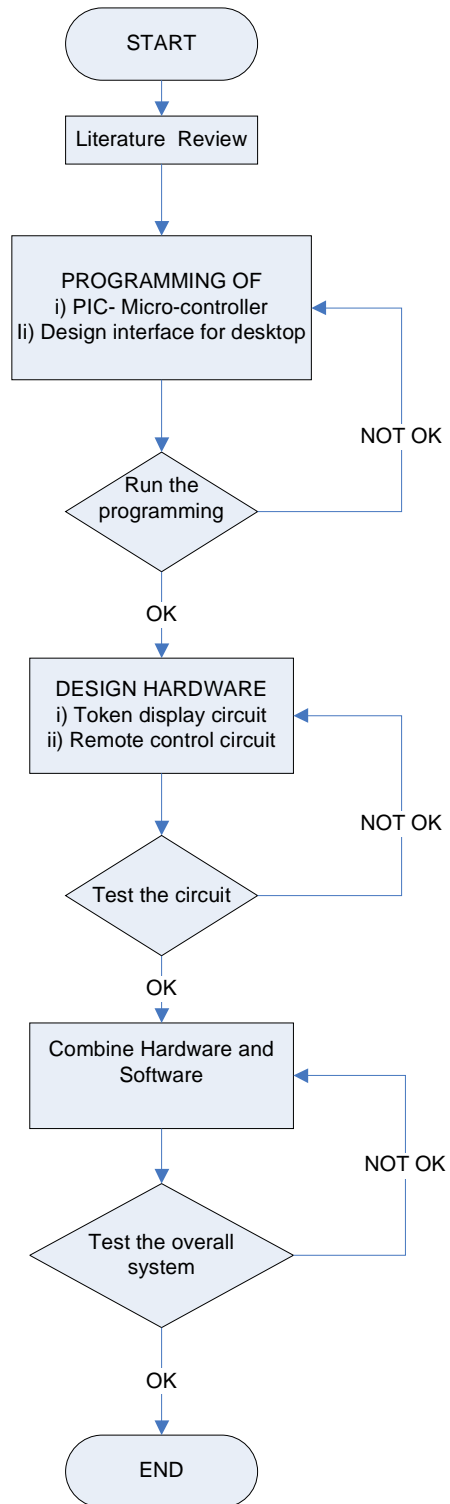


Figure 1.1 The methodology of project