PC THERMOMETER

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This Report is submitted in Partial Fulfillment of the requirements for the award of Bachelor of Electronic Engineering (Industrial Electronics) With Honours.

Faculty of Electronic and Computer Engineering
Universiti Teknikal Malaysia Melaka

April 2009

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UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : PC THERMOMETER

Sesi Pengajian : 2008/2009

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Dedicated to my beloved family especially my mother and father

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ACKNOWLEDGEMENT

Alhamdulillah…I'm grateful to Allah S.W.T, our Lord and Cherisher and Selawat to our prophet, Nabi Muhammad S.A.W and his family. I have completed my thesis which is partial fulfillment of requirements for the degree of Bachelor in Electronic Engineering (Industrial Electronic).

On this opportunity, I would like to express my gratitude to the Faculty of Electronic and Computer, University Teknikal Malaysia Melaka generally and sincere gratitude to my supervisor, Pn Hanim Binti Abdul Razak, for his assistance and guidance towards the progress of this project thesis. Throughout this semester, Pn Hanim Binti Abdul Razak has been patiently monitoring my progress and guided me in the right direction and offering his encouragement to me. Obviously the progress I had now will be uncertain without his assistance.

I am very grateful to my family especially my mom and dad and not forget also to my siblings for their unfailing encouragement and financial support that they have given to me for over the years.

My special appreciation and thanks to all my friends for their invaluable assistances towards this project thesis. And also to everyone who involve in this project either direct or indirectly.

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ABSTRACT

This project is to design and develop a device that can be used to measure temperature inside the computer's CPU. This project also can be designed for measuring temperature outside the computer's CPU. This project was used the Visual Basic 6 to develop a program and create a GUI display. The both of temperatures can be display at the GUI display. There is also a digital temperature sensor which is designed to detect a temperature value whether in Fahrenheit or degree Celsius unit. This project was used a note pad to overwrite the temperature value, date and time. The note pad was used as data storage to store the temperature value. So the user can monitor the temperature by view at a notepad. This project was useful for industrial and personal purposes. This project also can be divided into two important parts which are in hardware and software development. The hardware development was involved the circuit of PC Thermometer. The software development was involved the GUI display.

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ABSTRAK

Projek ini adalah untuk merekabentuk satu alat yang berkemampuan untuk suhu di dalam CPU komputer. Projek ini direkabentuk untuk mengukur suhu di luar CPU komputer. Projek ini menggunakan perisian Visual Basic 6 untuk membina satu program dan menghasilkan satu paparan GUI. Kedua-dua keadaan suhu akan dipaparkan pada paparan GUI. Terdapat pengesan suhu digital yang mana ianya dapat mengesan nilai suhu samaada dalam unit Fahrenheit dan darjah Celsius. Projek ini menggunakan notepad untuk merekod data suhu masa dan tarikh. Notepad digunakan sebagai penyimpanan data untuk menyimpan data suhu. Oleh itu, pengguna dapat memantau keadaan suhu tersebut dengan melihat pada notepad. Projek ini berguna pada industri dan kegunaan sendiri. Projek ini terbahagi kepada dua bahagian iaitu perkakasan dan perisian. Bahagian perisian adalah melibatkan litar PC Thermometer. Bahagian perisian adalah melibatkan paparan GUI.

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CHAPTER 1

INTRODUCTION

1.1 Project Introduction

Temperature was a quantity that behaves as an analogue likewise another basic quantity in surface of earth. Because of that, a sensitive electronic circuit needs to be used to measure and display on computer by digital. Temperature measurement can be done by using usual gauge such as thermometer and make notes at notebook. However, if the detail temperature it will be difficult to do the measurement manually.

In this project, a portable PC Thermometer will be designed to display temperature readings (°C or °F) of inside and outside computer CPU. This device is easy to use and temperature readings will be displayed on the computer screen using Visual Basic software.

1.2 Objective

The target of designing and constructing the device is to fulfilled several objectives that need to be achieved. Nowadays, sciences and technology is very important to us. Day by day, there a lot of something new and useful device have

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been created. Therefore, this project can be assumed as a contribution to the science and technology if it can be done successfully.

The objectives of this project are:

- To write and produce one program using Visual Basic to accept signal from the thermometer and display on computer screen.
- To interface Visual Basic 6 programming (software) with digital temperature circuit (hardware) by using DB9 cable.
- To develop an affordable temperature measurement device for PC user.
- To learn the art of Visual Basic 6 programming.

1.1 Scope of Project

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

- To develop a PC Thermometer circuit via DB9 cable.
- To develop a GUI display using Visual Basic Programming.
- To develop a notepad and use to store the temperature data

1.2 Problem Statement

There are digital thermometer which possess display part of its own in market but it is expensive where some type of this thermometer price are reach thousands of ringgit. Consumers also need to know how to use this equipment. For the temperature which does not have automatic temperature record tool, the price would be around hundreds ringgit. Consumers have to record by himself the temperature changes which occurred manually by writing temperature value inside the book. Imagine if users must record temperature value change to each moment for the long term half an hour and so on. It is difficult thing to do.

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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 and problem statement.

The second chapter will discuss about literature review about PC Thermometer. The discussion will similar project which is PC Thermometer but use the different method. The project will be explained briefly in this chapter. So, it is very important to understand the concepts involve and how this system works.

The third chapter is about 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.

The fourth chapter will discuss about the components used in this project. This chapter gives information about hardware and software involves in making this project works. This chapter also gives information about a circuit and the main components used. The components are DS1621 digital temperature sensor, LM2936z-5.0 Ultra low dropout voltage regulator and many more. It shows results, possible problems and solution for the problem occurred.

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

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CHAPTER 2

LITERATURE REVIEW

2.1 Literature Review

This chapter explains the previous research that that has been done. The main purpose of this literature research is to make the comparison of PC Thermometer that available in the market form aspect, temperature that are capped, error rate that resultant from each thermometer and resilience feature.

2.2 The Comparison Between This Project and Previous Project

Performance	PC Thermometer	Previous
Display temperature	Can display one or two temperature readings which is indoor and outside	Can display only one temperature reading
Port to connect to the computer	Using serial port	Using parallel port
Connector	Using the DB9 which has 9 pins	Using the DB25 which has 25pins

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File functions at the computer screen	-Log data to file -Fahrenheit unit -Number of IC sensor that to use -The sample time -The number of com port	-Save -Open -Print -Help
PIC	Do not use the PIC	Use the 16F84
The significant of these project	-For student to learnt the circuit functions -For the teachers to learnt the secret of IIC bus. -For person who want to learnt the digital temperature sensor (DS1621)	-For the student to learnt the PIC programming. -For the person who need the knowledge about the function of the sensor.
The advantages of using port	Serial Port Cable -Can transmit the data longer than parallel port -Serial port transmits '1' as voltage from -5 to -12V and '0' as voltage from +5 to +12V.	Parallel Port -Cannot transmit the data longer than serial port -Parallel port transmits '1' as voltage of 5 volts and '0' as voltage of 0 volts.

Table 2.2.1: Comparing Project Using Serial Port and Parallel Port

2.1 The PC Thermometer V2

This project was developed to detect and measure the temperature PC by using PC game port. A method of measuring the temperature by using the thermistor and connect to the PC game port. The temperature had been measured will be displayed in the system tray.

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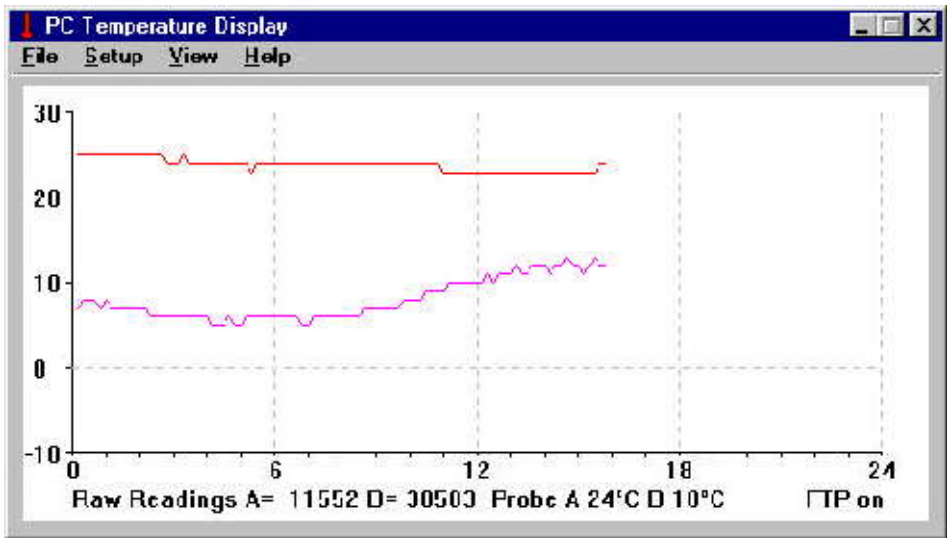

Figure 2.3.1 The system tray of GUI displayed

2.2 Simple PC Thermometer

This project was developed to measure and detect the temperature PC by using Serial port at PC. This project was involved two part that are the hardware and software. For the hardware part, the circuit was build using the component of diode, capacitor, NTC, resistor and serial port at computer. For the software part, this project was used the Microsoft Excel from Visual Basic 6.0 to set the graph.

2.5 PC Thermometer

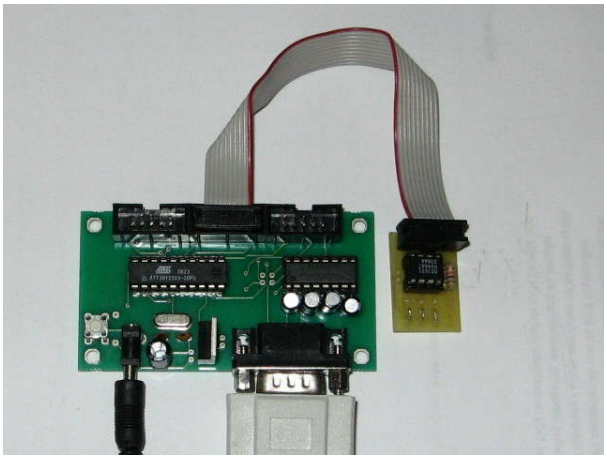

Figure 2.5.1 PC Thermometer

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This project was developed to show the temperature on the PC's screen. This project only plug in any serial port at computer's CPU. This project consists of the AVR 2313 Project board and the DS1621 Thermometer board and software for the PC. The AVR Project Board works as the interface between the DS1621 temperature board and the PC. The DS1621 Temperature board is connected to port of the ATTiny2313 microcontroller. The DS1621 measures the temperature and the microcontroller contains the firmware for passing through the measured temperature to the serial port. The AVR Projects Board has an on board voltage convertor, the MAX232, to convert the TTL signals of the microcontroller to the RS232 signals of the serial port. The AVR projects board has a 9-pin DB connector to hook the board to the serial port of computer's CPU.

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CHAPTER 3

PROJECT METHODOLOGY

3.1 Project Methodology

To achieve the goal that has been set in the objectives of this project, certain methods shall be used. Before starting on this project, research or literature review shall be done from books, internet websites, journals and course notes. This is to know the equipments, materials and components needed in building the project.

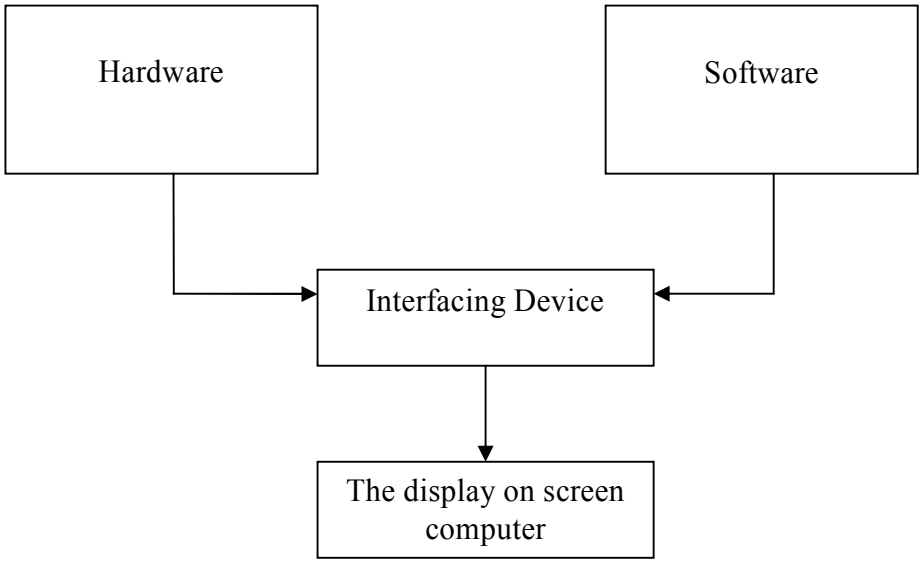

Figure 3.1.1 Project Methodology

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3.1.2 The Method / Procedure Project

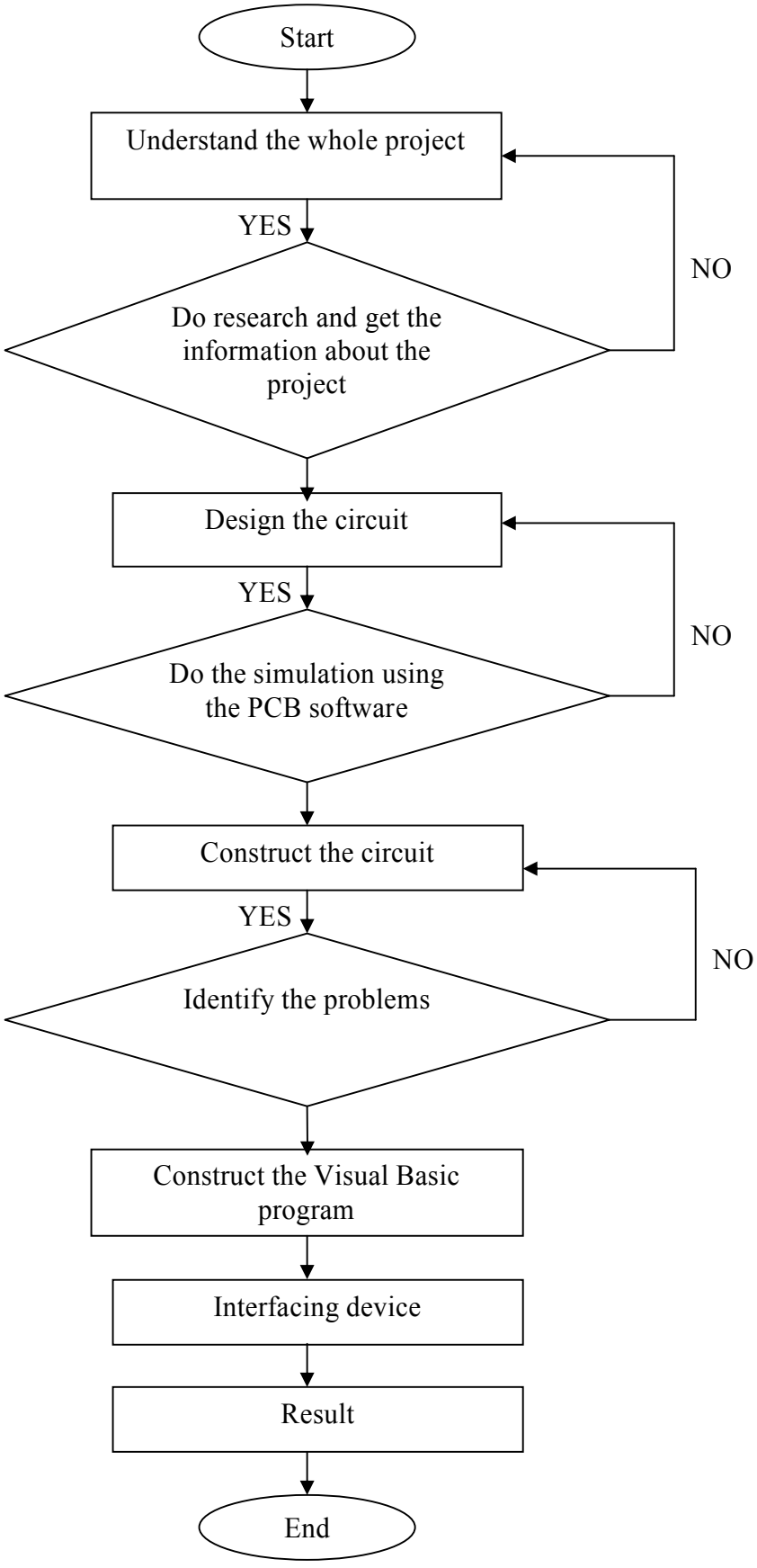

Figure 3.1.2 The Method Used

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