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Home security system / Noor Safizah Abdul Rahim.

HOME SECURITY SYSTEM

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2009

HOME SECURITY SYSTEM

NOOR SAFIZAH BINTI ABDUL RAHIM

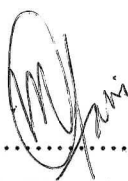
**A report is submitted in partial fulfillment of the requirements for the Degree of
Bachelor in Electrical Engineering (Control, Instrumentation and Automation)**

Faculty of Electrical Engineering

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2009

“I hereby declared that I have read through this report entitled “Home Security System” and found that it has comply the partial fulfillment for awarding the degree of Bachelor of Electrical Engineering (Control, Instrumentation and Automation.)”

Signature : 

Supervisor's Name : EN.MOHD FAIRUS BIN ABDOLLAH

Date : 16/11/2009

I declare that this report entitle “Home Security System” is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : *Safzal*
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Date : *16/11/09*

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I would like to dedicate this project to my parents, friends and anyone that helping me to complete this report. I hope this report is very useful to the future student as their revision later.

ABSTRACT

This home security system is designed based on microcontroller. The application of this project is to monitor the home security system by computer and manual. Programmable Integrated Chip (PIC), sensor and indicator are used in this project. This project describes a software environment for simulating microcontroller systems. The environment also accommodates data exchange with Visual Basic. The project has been divided into hardware and software. For hardware section, it consists of input and output devices. For input devices for this project PIR sensor and Shock sensor has been use. The microcontroller has a connection between input and output devices. The computer is interfaced to a home security system by a serial connection.

ABSTRAK

Projek keselamatan rumah ini direka berdasarkan sistem mikro pengawal. Projek sistem keselamatan rumah ini boleh diaplikasikan dengan menggunakan komputer dan secara manual. Cip Bersepadu Yang Boleh Aturcara (PIC), penderia, dan penunjuk digunakan di dalam projek ini. Projek-projek ini menggambarkan satu persekitaran perisian untuk menyerupai sistem pengawal mikro. Selain itu juga, ia menempatkan pertukaran data dengan 'Visual Basic'. Projek ini terbahagi kepada perkakasan dan perisian. Untuk bahagian perkakasan, ia mempunyai peranti masukan dan keluaran. Pada bahagian peranti masukan 'PIR sensor' dan 'Shock sensor' digunakan Mikro pengawal mempunyai kaitan antara peranti keluaran dan masukan. Komputer mempunyai ruang hubung kait untuk satu sistem keselamatan rumah secara hubungan sesiri

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LIST OF ABBREVIATIONS

GND	-	Ground
GUI	-	Graphical Using Interface
I/O	-	Input/Output
RAM	-	Random Access Memory
ROM	-	Read Only Memory
PC	-	Personal computer
PIC	-	Peripheral Interface Controller
PIR	-	Passive Infra Red
USART	-	Universal Synchronous Asynchronous Receiver Transmitter
VB	-	Visual Basic

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CHAPTER 1

INTRODUCTION

This chapter consists of explanations about the basic things about the project. It will discuss about the project background, objective of the project, problem statement, and scope in order to complete the project.

1.1 Background of Project

Development of home security system is a project that focused on intruder system. Today, home security system has many types and design. This home security system is an external security system by combining hardware and software development. This system is suitable to be controlled in home, office or public places.

The ultimate reason by doing this project is because nowadays not all security system using software and hardware to control the alarm and sensor and not all the system using the monitoring system to view where the places has intrude. This system will give an advantage to the consumer in money warranty and quality of this product.

1.2 Objective of Project

- 1) To adapt the micro controller system and software Visual Basic to the home Security system.
- 2) To build the control system that can monitored from other places by using the computer.
- 3) To build the system by integrates the software and hardware.
- 4) To study about home security system by using the shock sensor and motion sensor.

1.3 Scope of Project

Home security system is a big statement that included the fire alarm system, door lock system and burglar system. This home security system is focusing on burglar alarm system by combining the software and hardware. This home security is suitable to use because it covered the security in the house. Besides that, these projects develop to determine the suitable sensor to use in the house. It also uses the creativity to combine the two type of software, which is microcontroller and Visual Basic (VB).

Figure 1.1 show the scope of the project, this project has two inputs, which comprises of two type of sensor. The sensor will send the signal to PIC controller and further will sent the output signal to three types of indicator.

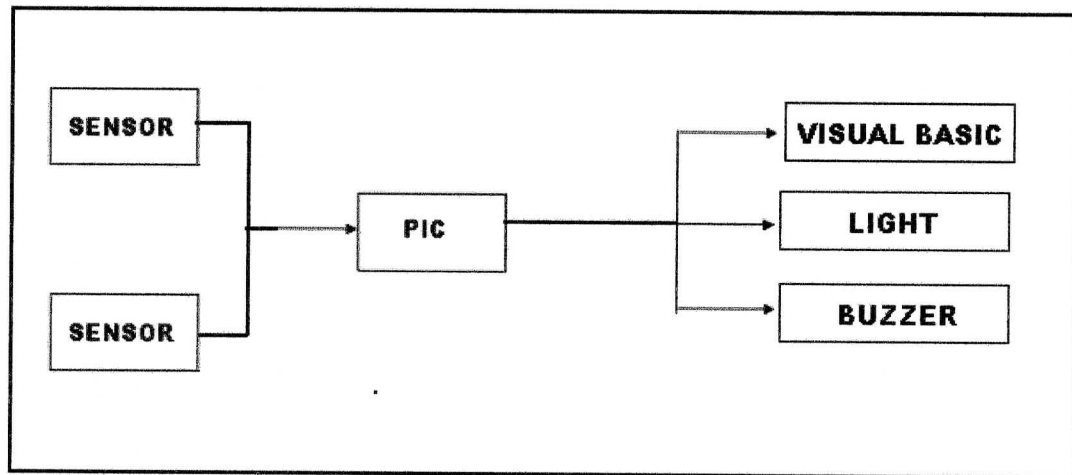


Figure 1.1:Scope of Project Block Diagram

1.4 Problem statement

There are many types of home security system that usually use now but current home security system only has a siren to protect the house, but in this project the system is directly connect to the computer and the monitor will view the intrude places.

CHAPTER 2

LITERATURE REVIEW

This chapter consists of explanations and reviews about the theory of main components, equipments, and programming languages that will be use in this project.

2.1 Flow diagram

In development, this project use software and hardware to complete the whole system. Two type of software has been use, which is Visual Basic and Micro C while in a hardware part devices used are PIR sensor, shock sensor, PIC circuit, light and buzzer. Figure 2.1 shows the block diagram of the project.

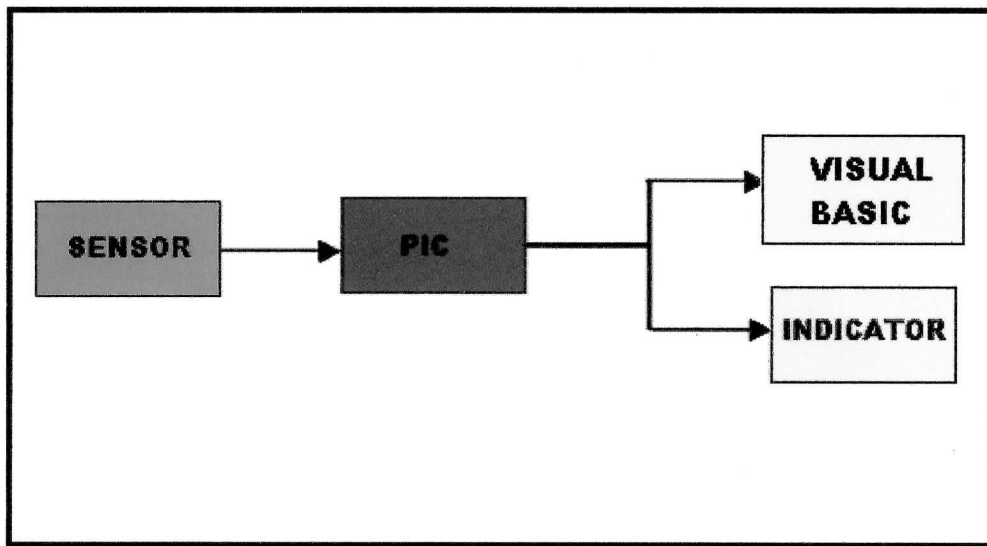


Figure 2.1: Block Diagram

2.2 Software

Two type of software are use, which is Visual Basic and Micro C. Visual Basic function as a GUI for the system while Micro C function as a connector between hardware n software.

2.2.1 Visual Basic

Visual basic is a development tool that can be use to build software application that perform useful work and look great within a variety of setting. Using Visual basic, it can create application for the windows operating system, the web, hand-held devices, and a host of other environment and settings. The most important advantage of Visual Basic is that it has been design to increase productivity in a daily development work but important additional benefit is that once become comfortable with the development environment in Microsoft visual studio 2008. [2]

This Visual Basic is use in this project as an indicator that connected to the computer and function to monitor the system from other places.

2.2.2 Micro C

Micro C is software for PIC. This software define as a micro programmed machine, a microprocessor or a microcomputer used in a control operation-that is, to direct or make changes in a process or operation. Software that will be use in this project is Micro C compiler.

2.3 Hardware

This project included of six combination of hardware which is, consists of PIR sensor, shock sensor, PIC starter kit, adapter, light and buzzer.

2.3.1 PIR sensor

Figure 2.2 shows the picture of the Passive infrared (PIR) sensor. PIR is a motion detector, this sensor measure infrared radiation emanating from object in the field of view. It only has one output pin and another two pin is connected to the 5V and GND separately. Apparent motion is detect when an infrared emitting source with one temperature such as human body, passes in front of source with another temperature, such as wall. The unit output is high whenever there is motion detected. If the motion is continuous, the output remains high. After motion stop, the output remains high for a few seconds depends on the variable resistor adjusted. It will remain high for the longer if H from the jumper is selected. For this project, the variable resistor is adjust as low as possible so that the output of the sensor would not remain high for a long time after motion stops.

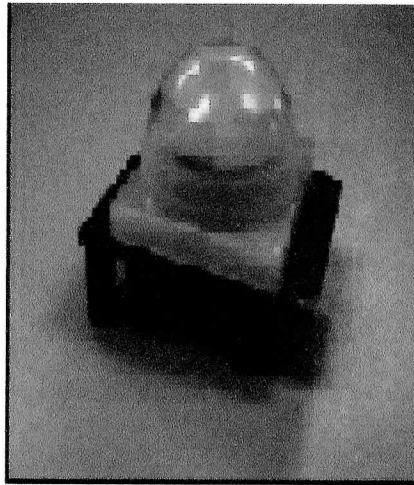


Figure 2.2: PIR sensor

The PIR sensor is a pyroelectric device that detects motion by measuring the changes in the infrared levels emitted by surrounding object. This motion sensor can be detected by checking for a high signal on a single input/output pin (I/O). There are some features products:

- Single bit output
- Small size make it easy to conceal
- Compatible with all type of micro controllers
- 5V till 20V operation with $< 100\mu\text{A}$ current draw.

Pyroelectric devices, such as the PIR sensor, have elements made of a crystalline material that generates an electric charge when exposed to infrared radiation. The changes in the amount of infrared striking the element change the voltages generated. Which are measured by an on-board amplifier. The device contains a special filter called a Fresnel lens, which focused the infrared signals onto the element. As the ambient infrared signals change

rapidly, the on-board amplifier trips the output to indicate motion. In table 2.1 is explain about the pin connection source of the PIR sensor. For connecting and testing, connect the 3-pin header to your circuit so that the negative (-) pin connect to ground, the positive (+) pin connect to the VCC and the OUT pin connect to the micro controller's I/O pin. The unit output is high whenever there is motion detector. In table 2.2 is a connection of jumper setting of the PIR sensor and the position of this two function is show in Figure 2.3.

Table 2.1: Pin definition and rating

Pin	Name	Function
-	GND	Connects to ground
Out	Output	Connects to an I/O pin set to INPUT mode.
+	VCC	Connects to Vcc (+5V to +20V) @ ~ 100 μ A

Table 2.2: Jumper setting

Position	Mode	Description
H	Retrigger	Output remains HIGH when sensor is triggered repeatedly. Output I LOW when idle (not triggered)
L	Normal	Output goes HIGH then Low when triggered. Continuous motion result in repeated HIGH/LOW pulse. Output is LOW when idle.