DESIGN AND IMPLEMENTATION OF ALARM SYSTEM BY USING MICROCONTROLLER (AT89S51-33P)

NIK NAZEHAN BINTI NIK OMAR

This Report is submitted in Partial Fulfillment of Requirements for the Degree of Bachelor in Electronic Engineering with Honours (Industrial Electronic)

Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer

Universiti Teknikal Malaysia Melaka (UTeM)

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Tajuk Projek : **DESIGN AND IMPLEMENTATION OF ALARM SYSTEM BY USING MICROCONTROLLER (AT89S51-33P)**

Sesi Pengajian : **2006/2007**

Saya   <u>NIK NAZEHAN BINTI NIK OMAR</u>
                                   (HURUF BESAR)

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Tarikh: 27 APRIL 2007   Tarikh: 27 APRIL 2007

DECLARATION

"I admit that this is done by me except the discussion and extracts taken from other sources that I explained each detail".

Signature   : ....

Name   : Nik Nazehan Binti Nik Omar

Date   : 27 April 2007

SUPERVISOR APPROVAL

'I admit that I have read this literature work through my observation which was fulfilled the scope and quality in order to be qualified for the conferment of Bachelor Degree in Electronic Engineering (Electronic Industry)'.

Signature   : ....

Supervisor's name : Pn Fauziyah Binti Salehuddin

Date   :   3 / 5 / 07

DEDICATION

To my parents, family members, friends and all which involved

ACKNOWLEDGEMENTS

Alhamdulilah, I finally able to complete the final year project and the thesis as well within the allocated time. First of all I would like to take this opportunity to express my appreciation to some organizations and individuals who have kindly contributed to the successfully completion of my final year project in UTeM. With the cooperations and contributions from all parties, the objectives of the project; soft-skills, knowledge and experiences were gained accordingly.

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ABSTRACT

An alarm system is the most important in our life because we can secure our house or office from an incident such as burning and burglary. Alarm system project is a combination of software and also hardware, where it uses microcontroller technology where the program is simulate or develop in an integrated circuit and works as a controlling circuit for alarm system. To avoid intrusion and conflagration case, every house must be able to provide a suitable safety system for ourself and our family. This system can be using if one of the problems happens in the house. The system can contact the number of mobile or office and something like that. The telephone number is homeowner number and all the number that was setup in programming. Heat detector and burglar alarm that was using in this system to detect the possible things and to warning the owner of the house. Generally, it used burglar alarm circuit, heat circuit, microcontroller and interface circuit. It can detect burglary and burning house. It performs when the magnetic sensor detects any burglary and heat sensors (NTC) detect a temperature. The temperature range is about $30^{O}C$ and above. When the house or office is burning, siren signal is active and if the magnetic sensors detect any burglary, an emergency light is active. If the microcontroller detect heat is about several minutes, the program that was setup in microcontroller automatically dialing the telephone number. We can set the number of mobile, office, police, BOMBA and so on.

ABSTRAK

Sistem penggera adalah sangat penting dalam kehidupan seharian kerana dapat melindungi kediaman atau pejabat daripada kejadian seperti diceroboh oleh pencuri dan kebakaran. Sistem penggera ini adalah kombinasi daripada pembangunan perisian dan perkakasan litar, di mana ia menggunakan teknologi pengawal mikro iaitu program akan diprogramkan ke dalam litar bersepadu dan bertindak sebagai pengawal litar sistem penggera. Untuk mengelak dari terjadinya pencerobohan dan kebakaran besar, setiap kediaman mesti menyediakan sistem keselamatan yang sesuai untuk diri sendiri dan keluarga. Sistem ini boleh digunakan jika salah satu daripada kejadian tersebut berlaku. Sistem ini akan menghubungi telefon bimbit atau telefon pejabat dan seumpamanya. Nombor telefon itu adalah nombor telefon pemilik kediaman dan kesemua nombor yang terlibat adalah ditetapkan di dalam program. Pengesan pemanas dan penggera penceroboh digunakan di dalam sistem ini untuk mengesan kesemua kemungkinan yang berlaku dan memberi amaran kepada pemilik kediaman. Umumnya, sistem ini menggunakan litar penggera penceroboh, litar pengesan pemanas, litar antaramuka dan litar pengawal mikro. Sistem ini akan mengesan pencerobohan dan kebakaran. Ia akan berfungsi apabila penderia bermagnet mengesan sebarang pencerobohan dan penderia pemanas (NTC) mengesan suhu. Julat suhu adalah 30°C dan keatas. Apabila rumah atau pejabat terbakar, isyarat siren akan aktif dan jika penderia bermagnet mengesan pencerobohan, lampu kecemasan akan menyala. Jika pengawal mikro mengesan kepanasan dalam beberapa minit, aturcara akan mendial nombor telefon yang telah ditetapkan di dalam pengawal mikro. Kita boleh menetapkan nombor telefon bimbit, pejabat, BOMBA, polis dan sebagainya.

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LIST OF ABBREVIATIONS

PIR	- Passive Infra-reds
NVM	- Non-Volatile Memory
LED	- Light Emitter Diode
NO	- Normally Open
NC	- Normally Close
PC	- Personal Computer
CD	- Compact Disk
CMOS	- Complementary Metal-oxide Semiconductor
I/O	- Input/Output
VCC	- Positive Power Supply
GND	- Ground
RST	- Reset
PSEN	- Program Store Enable
ALE	- Address Latch Enable
EA	- External Access Enable
RAM	- Random Access Memory
CPU	- Central Processing Unit
PCB	- printed circuit board
ISP	- In-System Programmable
ASM	- Assembly Language
PTC	- Positive Temperature Coefficient
NTC	- Negative Temperature Coefficient
RTD	- Resistance-temperature detector
DC	- Direct Current

CO   - change-over

XOR   - Exclusive OR function

UV   - Ultra Violet

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CHAPTER 1

INTRODUCTION

1.1   INTRODUCTION

Generally, this system is safety equipment that detects the fire and house breaking. It is done as a protection in buildings or houses. This project is to design and implement burglar and heat alarm system, which have relavance to security information. By using this system, people and consumer can know and verify status situation their homes and also at office. It can detect fire and house breaking faster and can give preacaution for the people in the house or building to leave the incident place as soon as possible in order to safe their life. Apart from that, it makes easier for some people to safe victims or valuable things.

1.2   PROJECT OVERVIEW

Alarm system project is a combination of software and also hardware, where it uses microcontroller technology where the program is simulate or develop in an integrated circuit and works as a controlling circuit for alarm system. Besides that, it is connected with telephone such as fixed line phone at home. The signal of burglar and heater are siren and emergency light. For burglar alarm, magnetic sensor is used and for heat alarm heat sensor (NTC) is used. When heat sensor detect a temperature above 30°C, it can connected to microcontroller.

The output of heating is siren signal. Siren can produce the sound. If the magnetic sensor detected any burglary, it can produce a flicker of emergency light. When the microcontroller still detect any heating from the heat sensor, it can calling or dialing the owner of the house automatically. Besides that, it also calling for an any number that was set up in the programming.

By using this system, people can know the incident that happens at the house, office any something like this. It can verify any possiblelity that happens at home by using this system. Many security system applications can give a signal when it detect any burglary and burning but this system can verify the incident causes and how to control the situation. It is important to validate the incident that happens in order to use the signal for security related systems.

1.3 OBJECTIVES

The objectives of the project consist of:

a) To implements a circuit that can analyze a burning and burglary by using microcontroller.

b) To design of this system is automatically calling/dialing the number that was setting in microcontroller programming and do not need to take a hand of the telephone. It connected to fixed line telephone.

c) To Study the types and operation of sensor relay and heat sensor in the market.

1.4 PROBLEM STATEMENT

Currently, intrusion and conflagration case always happens in organized of community. To avoid this problems, every house must be able to provide a suitable safety system for ourself and our family. This system can be using if one of the problems happens in the house. The system can contact the number of mobile or office and something like that. The number is the number owner of the house and all the number that was setup in programming. In this case, safety is the most important to avoid the bad things happens. As a conclusion, heat detector and burglar alarm that was using in this system to detect the possible things and to warning the owner of the house.

1.5   SCOPE OF WORK

The scope of this project is to design and implementation an alarm that can detect an incident of burning and burglary at house and office. This system is used three signals for shown a house or office is dangerous. The signals are such as an emergency light, siren, fixed line phone and telephone. Actually, an emergency light is flicker when one of the relay is active. But when both of the relay is activated, siren and emergency light is active automatically. At the same time, microcontroller can give a signal for take an action. Connection from programming in microcontroller to fixed line phone is active and the program that was setup in microcontroller automatically dialing the telephone number. The number that include in programming is up to the owner of the house or office. In this project or system, the number that was set up in programming is mobile number.