AUTOMATIC ALARM DIAL (AAD) SYSTEM

ZAKIAH BINTI DAUD

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

UNIVERSTI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

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_____
(COP DAN TANDATANGAN PENYELIA)

MOHD SA'ARI B MOHAMAD ISA
Pensyarah
Fakulti Kej Elektronik dan Kej Komputer (FKEKK),
Universiti Teknikal Malaysia Melaka (UTeM),
Karung Berkunci 1200,
Ayer Keroh, 75450 Melaka

Tarikh: 10 MEI 2007

Tarikh: 10/MEI/2007

"Hereby, I declare that this thesis is a result of my own research and idea except for

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Author   : ZAKIAH BINTI DAUD

Date   : MEI 2007

"I hereby declare that I have read this report and in my opinion this report is sufficient in terms of scope and quality for the award of Bachelor of Electronic Engineering (Telecommunication Electronics) with honours."

Signature   : ....

Supervisor's Name : ....

Tarikh   : ....

MOHD SAFARI B MOHAMAD ISA
Pensyarah
Fakulti Kej. Elektronik dan Kej Komputer (FKEKK),
Universiti Teknikal Malaysia Melaka (UTeM),
Karung Berkunci 1200,
Ayer Keroh, 75450 Melaka

10/MEI/2007

For my mum and dad, all family members, friends

&

Mr Mohd Sha'ari Mohamad Isa

ABSTRACT

Nowadays, the implementations of this idea have been attempted by using the telephone line modem. However, this solution is complex and requires physical connection to access that device and need to connect to the cooper telephone line. The system also can detect only one device in a time. A simple, cost effective solution is proposed here by which system as mention above can send the data through SMS, which is cheaper than dialing and cost more or less same with respect to geographical distance. In today's world, there is a great demand for application that can receive the information by using SMS technology. AAD System is design to send information through SMS to the engineer or technician at the equipment room. It can ease the engineer to get the information during the outstation. This system is needed because mostly the equipment important during the transmission data to the pilot.

ABSTRAK

Pada masa sekarang, sistem penggera keselamatan ini telah ada mengguna modem wayar telefon. Bagaimana pun sistem ini kompleks dan memerlukan penggunaan fizikal untuk menggunakannya dan perlu perlu disambungkan ke wayar telefon. Sistem tersebut juga hanya dapat mengesan satu peralatan sahaja dalam satu masa. Sesuatu yang ringkas, kadar kos yg berpatutan dicadangkan dimana sistem ini dapat menghatar data menerusi pesanan ringkas (SMS), di mana ianya lebih murah berbanding menghantar pesanan secara menelefon sesuatu nombor. Sistem ini direka untuk mengantar maklumat menerusi sistem pesanan ringkas (SMS) kepada jurutera atau juruteknik yg bertugas. Ini akan memudahkan jurutera mendapat maklumat sekiranya mempunyai tugasan luar.

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PROJECT INTRODUCTION

1.1   INTRODUCTION

The implementation of this idea is being attempt by using the telephone line modem. However, this solution is complex and requires physical connection to access that device and need to connect to the cooper telephone line. The system also can detect only one device in a time. A simple, cost effective solution is propose here by which system as mention above can send the data through SMS, which is cheaper than dialing and cost more or less same with respect to geographical distance.

Nowadays, SMS has become very popular. The Short Message Service SMS, as defined within the GSM 900 / 1800 / 1900 digital mobile phone standard has several unique features. A single short message can be up to 160 characters (7 bit coded) or 140 characters (8 bit coded) of text in length. Those 140 / 160 characters can comprise of words, numbers, or an alphanumeric combination. The Short Message Service features confirmation of message delivery. This means that unlike paging, users do not simply send a short message and hope that it is delivering. Instead, the sender of the short message can receive a return message back notifying them whether the short message is

delivering or not. Moreover, SMS support national and international roaming. With PCS networks based on all the three technologies (GSM, CDMA and TDMA) supporting SMS, SMS has been rendered a universal mobile data service.

Controller in DCA (Department of Civil Aviation) will have a problem to send the information to the pilot if some of the equipment at the equipment room have a problem or hang. By the solution purpose, such the problem will be solving immediately when the system status will be monitor by appropriate networking. In this method, engineer can get the information about the failure equipment immediately through SMS and the equipment can be repair.

1.2   PROBLEM STATEMENT AND PROJECT OBJECTIVE

AAD System is design to send information through SMS to the engineer or technician at the equipment room. It can simplicity the engineer to get the information during the outstation. This system is needed because mostly the equipment important during the transmission data to the pilot. To success in this project, a few objectives need to achieve.

1. To design complete hardware that can operate when the system is detected.
2. To know about PIC microcontroller that suitable for this system.
3. To build up a complete hardware.
4. To create programming using C language to know the type of equipment that has a problem and transmits the data through the serial cable to the GSM modem.

1.3   SCOPE OF WORK

To archive the project objective there are certain scope that must been done. The scopes are:

1) Develop hardware

- PIC16F877 can operate when the system is detected. The system can be detected switch or sensor on/off one at a time.

2) Develop software

- The programmed should know the type of sensor or switch and can send the information through the SMS that give detailed on time and place/switch. As example, it automatic notifies to the engineer when the temperature sensor is detected. Because of the equipment will be broken when high temperature, so the engineer can take only a short time to begin the maintenance by using this system compared to the system before that we cannot detect immediately.

1.4 THESIS STRUCTURE

The contents of this thesis are all about the project had been done. This thesis will be divided into 5 chapters to provide reader to understand the whole project.

Chapter 1 cover at the overview of the project

In chapter 2, it will cover up all the project methodology, circuits, and how the project going to be implement. Also hardware technical details are explain here.

Chapter 3 cover project methodology.

Chapter 4 contains result and analysis of the whole project.

Chapter 5 will be about the whole contents of this thesis and this project. By the end of this project, there are some proposal and discussion for this project.

CHAPTER 2

LITERATURE REVIEW

2.1   INTRODUCTION

This chapter will focus on the basic concepts and theories needed for the development and implementation of the project.

2.2   CONCEPT OF PROJECT DEVELOPMENT

Nowadays, alarm system is very popular and there is a great demand for application that can receive data as soon as possible. The applications include home, building and factory alarm system and etc. Over the last decade, the implementation of this concept

has been attempted by using the internet and power-line modem. However, these solutions only can be received to the engineer or technician if they are at the remote room. To improve the implementation is purpose here, by which application mention above can receive the information and the alarm status as soon as possible anywhere across the globe.

Short Message Service (SMS) is a mechanism of delivery of short messages over mobile networks that are widely spread across the globe. In this project, when the system is detected, the data will be analyze by the PIC and the PIC will determined HIGH/LOW status and then the data will send to the computer through the parallel cable. The computer program will analyze the data again then the data will send to the mobile phone through the SMS system.

2.3   COMPONENT OVERVIEW

2.3.1   PIC16F877 Microcontroller

Microcontroller differs from a microprocessor in many ways. First and the most important is its functionality. In order for a microprocessor to be used, other components such as memory, or components for receiving and sending data must be added to it. In short that means that microprocessor is the very heart of the computer. On the other hand, microcontroller is designed to be all of that in one. No other external components are needed for its application because all necessary peripherals are already built into it. Thus, we save the time and space needed to construct devices.
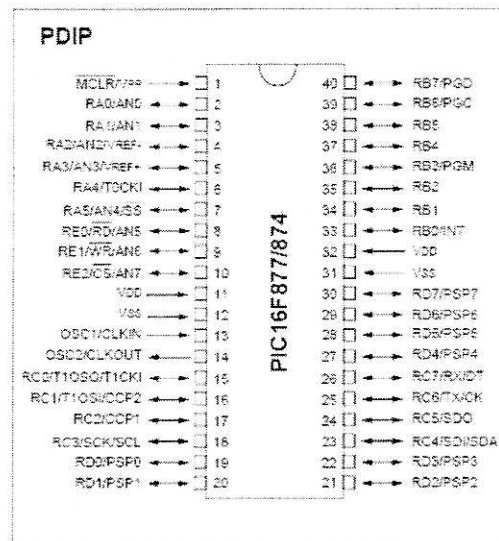
Figure 2.1: Pin Diagram of PIC16F877

The PIC microcontrollers are based on RISC (Reduced Instuction Set Computer) architecture. Most PICs used 35 instructions compared to some general-purpose microprocessor that may have several hundred. Important feature of modem PIC devices is the use of electrically erasable and programmable Flash memory for program storage. Flash is easier to work with for one-off prototyping because erasure and reprogramming is greatly simplified.

Why use PIC16F877? This is because this PIC is suitable for particular of this system. It has USART port for serial communication that well supported. . USART stands for Universal Synchronous Asynchronous Receiver Transmitter. It is sometimes called the Serial Communications Interface or SCI. The most common use of the USART in asynchronous mode is to communicate to a GSM serial port using the RS-232 protocol. The USART can be configured to transmit eight or nine data bits by the TX9 bit in the TXSTA register. If nine bits are to be transmitted, the ninth data bit must be placed in the TX9D bit of the TXSTA register before writing the other eight bits to the TXREG register. Once data has been written to TXREG, the eight or nine bits are moved into the transmit shift register. From there they are clocked out onto the TX pin

preceded by a start bit and followed by a stop bit. In the other hand, this IC also has large memory compare to PIC16F84.
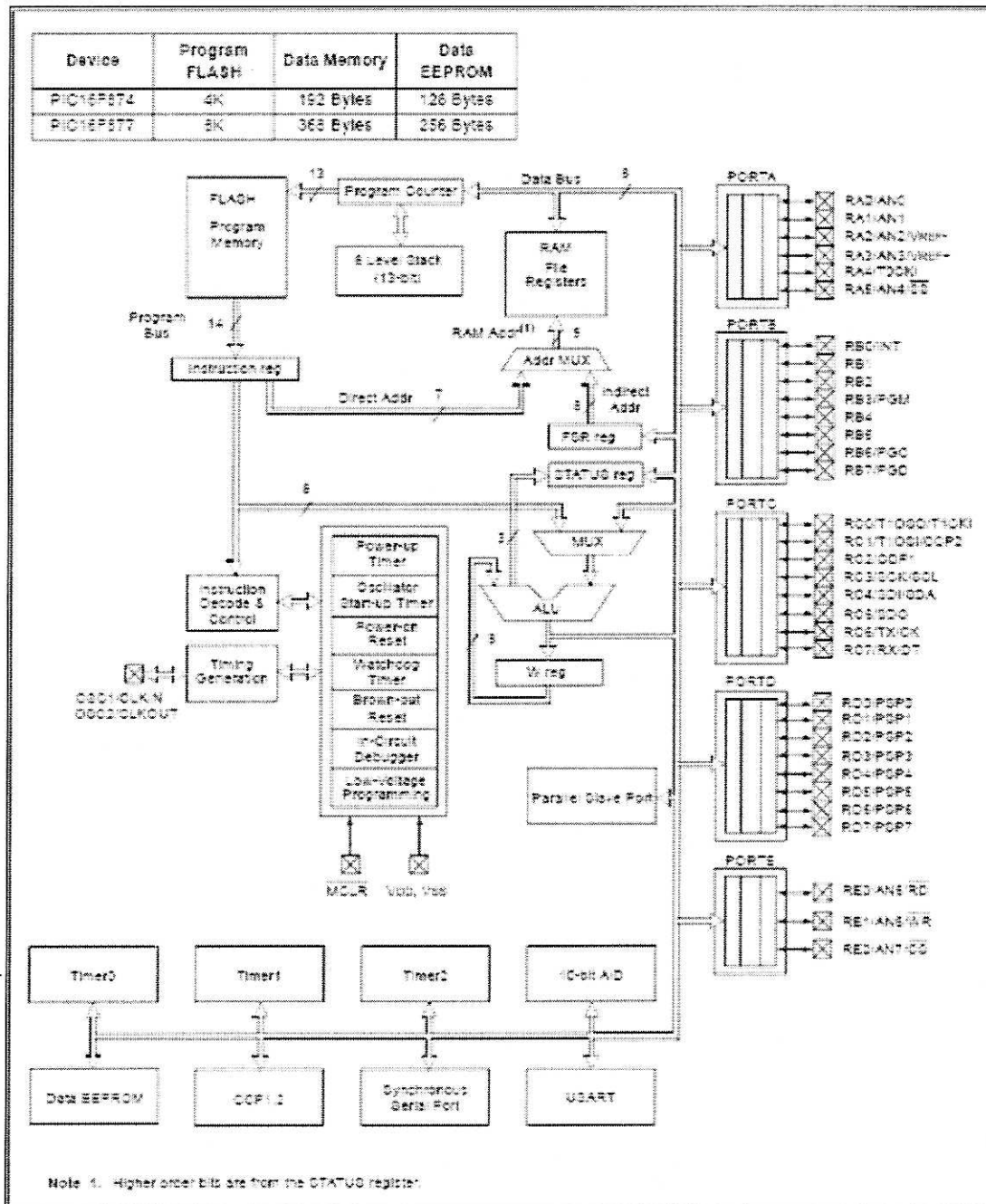

Figure 2.2: PIC16F877 Block Diagram.

Pin	function
1	Master Clear (Reset) input or programming voltage input. This pin is an active low RESET to the device.
2	RA0 can also be analog input 0 for switch 1.
3	RA1 can also be analog input 1 for switch 2.
4	RA2 can also be analog input 2 or negative analog for switch 3.
13	Oscillator crystal input/external clock source input.
14	Oscillator crystal output. The pin is connected to crystal or resonator in crystal oscillator mode. In RC mode, OSC2 pin outputs CLKOUT which has 1/4 the frequency of OSC1, and denotes the instruction cycle rate.
25	RC6 can also be the USART Asynchronous Transmit or Synchronous Clock.
11/32	Positive supply for logic and I/O pins.
12/31	Ground reference for logic and I/O pins.

Table 2.1: Function of pin PIC16F877