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COMPUTER INTERFACING CAR PARK SYSTEM

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BEKC

2009

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"I hereby declared that I have read through this report and found that it has comply the partial filfillment for awarding the degree of Bachelor of Electrical Engineering (Control, Instrument & Automation)"

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Date : May 2009

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COMPUTER INTERFACING CAR PARK SYSYTEM

MOHD NASRULHADI BIN NGADEMIN

This project report is presented in partial fulfillment of the requirement for the award of the Bachelor's Degree of Electric Engineering (Control, Instrumentation & Automation) Hons.

Faculty of Electrical Engineering
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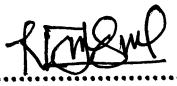
Signature : 

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Specially dedicated to

My beloved parents, sisters and brothers.

Thank you for the endless support and encouragement

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ABSTRACT

Nowadays, the current car park system is not user friendly. To solve this problem, this project is designed and developed a car park system by interfacing between software and hardware. This system requires user to fill up the matrix number and plat car number to get access the system. For the security system, the database for this project is designed and developed. The purpose of database designed is for security when unanticipated situation is occurring. The stored information in that database will be used to resolve that problem. This car park is separated by 3 sections. There are for student, staff and visitor. This car park has count system and it would display the total park that left. The development of graphical user interface (GUI) is implemented by using Visual Basic 6.0. To connect between software and hardware the parallel interfacing is used. The prototype of car park system is designed and built up. For this prototype, the stepper motor is used to move the barrier gate. That stepper motor is controlled by the software (visual basic 6.0). The testing and analysis of this project is included on the report.

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ABTSRAK

Sistem tempat letak kereta yang terdapat pada masa kini adalah tidak mesra pengguna. Justeru itu, bagi menyelesaikan masalah ini, projek sistem tempat letak kereta pintar ini telah direka dan dibangunkan. Sistem ini akan menghubungkan antara perisian dan perkakasan. Sistem tempat letak kereta ini juga memerlukan pengguna untuk memasukkan nombor matrix dan nombor pendaftaran kereta bagi menggunakan sistem ini. Sebagai langkah keselamatan, sistem pangkalan data bagi projek ini telah direka dan dibangunkan. Tujuan bagi rekaan pangkalan data ini adalah untuk langkah keselamtan jika berlaku seseuatu yang tidak dijangka. Maklumat yang tersimpan dalam pangkalan data ini akan digunakan bagi membantu menyelesaikan masalah tersebut. Kawasan tempat letak kereta ini akan dibahagikan kepada 3 bahagian, iaitu pelajar, staf dan pelawat. Sistem tempat letak kereta ini mempunyai sistem pengira dan ia mampu memaparkan jumlah tempat letak kereta yang masih belum digunakan. Sistem ini menggunakan pengantaramuka grafik (GUI) yang mana direka dan dibangunkan menggunakan perisian *Visual Basic 6.0*. Bagi menghubungkan antara perisian dan perkakasan, pangkalan selari telah digunakan. Prototaip bagi sistem tempat letak kereta ini telah direka dan dibangunkan. Bagi mengawal pergerakan palang, motor berperingkat telah dipilih dan digunakan. Motor berperingkat ini telah dikawal mengunakan perisian *(Visual Basic 6.0)*. Segala ujian dan analisa bagi projek ini telah dimuatkan sekali dalam laporan ini.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Parking is the act of stopping a vehicle and leaving it unoccupied for more than a brief time. For most motorized vehicles, there are four basic modes of parking, based on the arrangement of vehicles which is parallel parking, perpendicular parking, angle parking, and Anderson parking. These are self-park configurations where the vehicle driver is able to access the parking independently.

Nowadays our countries are increasingly congested by the vehicles and at same the parking area is limited. The factor of this problem it is because the prices of the land are expensive. So the increasing of vehicle uses is give affect on parking area that has been prepared. It is causes the users to find an unoccupied parking space on trial and find method. Mostly users is waste their precious time just to find the unoccupied parking space.

Sometimes there is parking lot that has been reserved. But there are several users do not follow orders. So the smart car park system is developed solve the problem. This system is divided the parking lot according to the type of user. Most of the parking system now, does not record the information data of cars user when they use that parking system. So for improving the safety system, the database system is developed. The reason of developed the database is for the security system in case there are have a problem occurs and that data are used for information.

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For using the smart car park system, the user just only need to fill up the matrix number and plat car number to access this system. To make the development of this system become, the Visual Basic 6.0 software is used. The software visual basic 6.0 is selected is because it easier to use differ to other software.

1.2 Project Objectives

For develop any project, there must have the objective that must be achieve. For this project there are have 5 objectives. The objectives of this project are:

1. To design graphical user interface (GUI) using visual basic.
2. To design a prototype of a smart car park system.
3. To interface between software and hardware by using the computer interfacing.
4. To control the motor.
5. To develop the database system for car park users.

1.3 Scope of the Project

The main scope of this project is to develop the system user friendly. For the first scope is the graphical user interface is designed by using software visual basic 6.0. The second of the scope is controlling the stepper motor by using the graphical user interface that created by using software visual basic 6.0. For interfacing between hardware and software, the parallel port is used for computer interfacing.

The third of the scope is the designing the prototype. Those prototype are consist the site area car park and barrier gate. This site area car park is separated by 3 sections, there are for student, staff and visitor. The last of the scope is created the database. The purpose created database is to record the information of user car park. This database will be created by using Microsoft access.

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1.4 Problems Statement

Nowadays, the current of car park system is not user friendly. So, this application project to make sure the system is friendly to the user and at the same time to make sure the users will not waste their time to find the parking lot.

There are no parking system will record the user data of parking nowadays. So in this project it will include the database system of car users. This project will separate the lot parking to the 3 sections, there are for student, staff and visitor. With this system the security guard will easier to manage their security system of the car lot.

Most of the parking system are not implements the counter in their system. This system will have the counter system, for count the car is come in or out. So this system is more effective than other systems.

1.5 Literature review

In this part there are some journals that have been taken from the IEEE website to be as a reference for this project. This part reviews existing project created to get an idea about the project design, conception and any information that related to improve the project. There are many creations and innovations of projects that have been done by other people with differences concept and design.

1.5.1 Parking Monitor System Based on Magnetic Field Sensors. [7] (Joerg Wolff, Thomas Heuer, Haibin Gao, Michael Weinmann, Stefan Voit and Uwe Hartmann, 2006)

This journal is about the application of magnetic field sensor in parking system. To find an occupied parking space in the maze of a downtown area often works on a trial and error basis. Time needed and distance to drive could be significantly reduced if drivers were directed to an unoccupied parking space. Because of this problem, a detector system based on

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magnetoresistive sensors was developed and a test system was installed in a local car park. The principle of the magnetic sensing is magnetoressistive sensors utilize the Earth's magnetic field as a bias field for detecting the presence of ferromagnetic objects. The detector is based on three axes on a three arrangement of off the shelf low cost magnetoresistive sensors. AMR (Anisotropic Magneto - Resistive) sensor has been used because of small size, low energy consumption and competitive price. The developed system can be install indifferent site various detector position. The advantage of this detector positioning is straightforward installation without effects on the parking operations.

1.5.2 Declarative GUI Programming in Microsoft Windows. [8] (Panagiotis Louridas, 2007)

This journal is about the declarative GUI in Microsoft windows. There is some special tool for user to ease create the GUI. There are application forms, menus, dialog boxes, and other interface elements and automatically translate the models to the code that builds them. These tools produce code that's nearly unreadable by human beings. A domain-specific language for building user interfaces offers a more transparent way for programmers to specify interface elements. There are many language that can be use to create the GUI. In fact, it can be mix code from any supported languages (such as C, C++ and visual basic) in a single application containing the XAML and the code-behind files. Visual basic language mostly used to create the GUI because it very friendly program to learn and built GUI as interface.

1.5.3 A Parallel Port Interface Circuit for Computer Control Applications Involving Multiple Stepper Motor. [9] (Mike J. Johnson and Guru Subramanyani, 1997)

This journal is about the parallel ports that have been tested to control stepper motor. The interface circuit was designed for multiple stepper motor control using DB-25. Five stepper motors were used in this project, four for controlling a robotic manipulator arm with four degrees of freedom, and one for a linear positioning table. The parallel port contains the data lines D0-D5 status lines, and 4 bi-directional control lines. The status lines have been

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used to for input and the higher bits were used to control the stepper motor. Figure 1.1shows the connection to computer. Digital logic circuits were required to implement the interface circuit for multiple stepper motor control. A power output circuit consisting of NPN power transistors was required to translate the TTL level outputs from the digital control logic into required power level for the stepper motors. In this journal, a QBASIC program was developed for controlling the stepper motor.

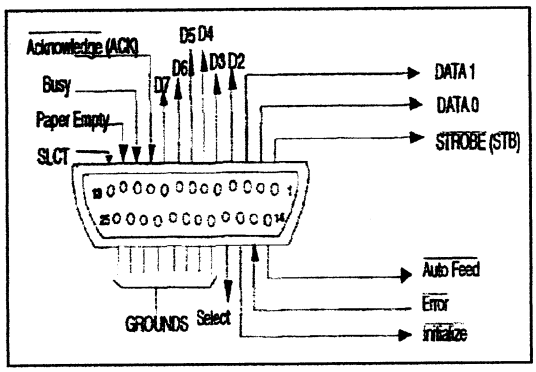

Figure 1.1: DB25 connector to PCs

1.5.4 A PC Based Instrument for Measurement and Analysis of the Starting Current of a Motor. [11]

(Lei Shauchong, Shao Zhiabao, Guo zhonglin and Wang Failing, Xi'an Jiantong University, 2007)

A instrument equipment has been designed and implemented to measure and analyze the real-time current and voltage of sudden change, which often occurs at the startup of motors. This paper gives the algorithm for eliminating errors in rms value estimations and the algorithm for compensating voltage variation. The digitized signals are sent to a pc directly through an epp (enhanced parallel port), so neither the special communication interface nor additional buffers are needed. That makes the instrument simple in realization and convenient for use. With hall effect probes, this instrument can measure currents as high as 6000 amps fast and accurately. The measured values can be displayed either in real-time waveforms or in rms value curves according to the user's choice. The figure 1.2 shows the overall system flow.

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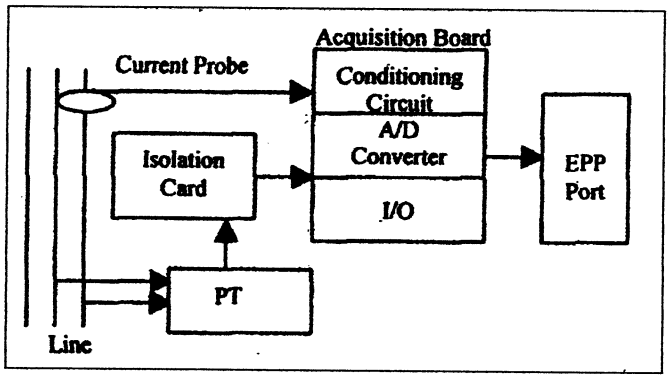

Figure 1.2: Block diagram of the system

1.6.0 Theory

In this part there will explain about the component that used in this project. In this part also the functional of the component are explained. The advantages and disadvantages of that component also explained.

1.6.1 Parallel Port

A parallel port is a type of interface found on computers (personal and otherwise) for connecting various peripherals. It is also known as a printer port. For linking between computer and prototype, it needs interfacing. There are two types that mostly used for interface, there are serial and parallel. For this system, parallel port is used for interfacing. Usually ports are found on the rear of computer and have the following two types; male ports having pins coming out of port and female ports having holes for the pin. Generally a 25 pin female connector with which a printer is usually attached. Figure 1.3 shows the male and female parallel port DB-25.

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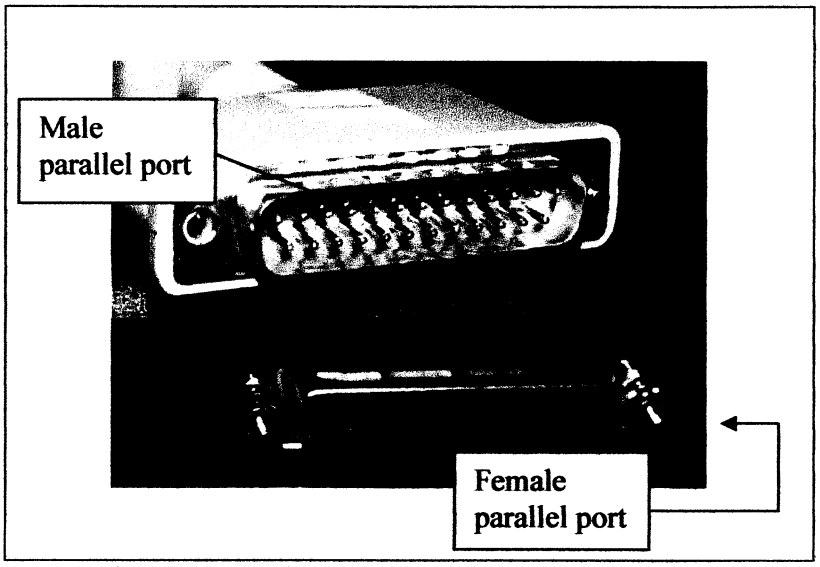

Figure 1.3: Male and Female Parallel Port DB-25

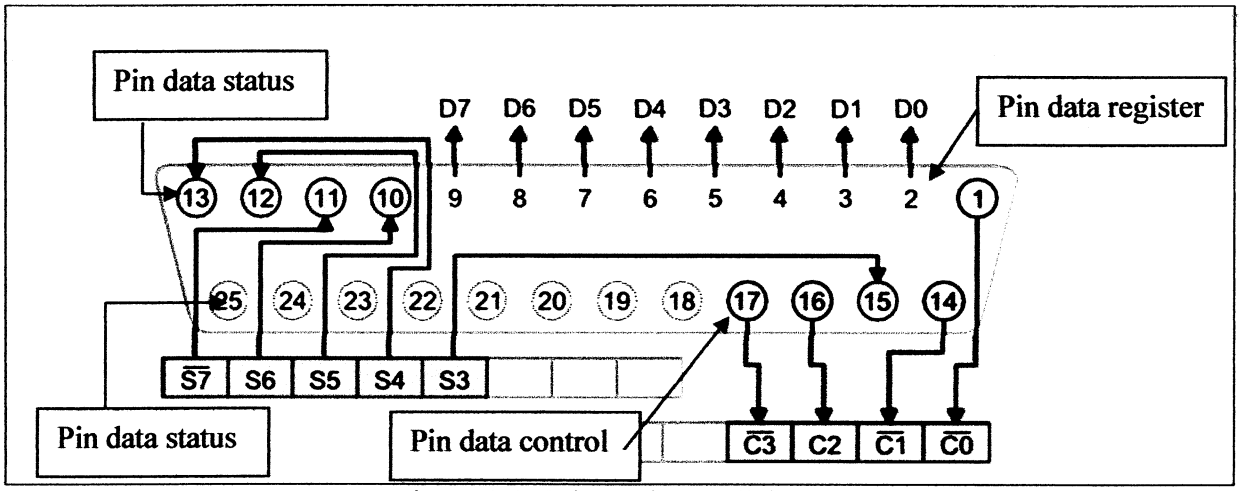

Figure 1.4: Schematic Parallel Port

Mostly there are 4 type of group register. There are data register, status register, control register and earth register. Figure 1.4 shows the schematic of parallel port which show pin for data register, pin data for status and pin data for control.

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1.6.1.1 Data Register

The base address, usually called the Data Port or Data Register is simply used for outputting data on the Parallel Port's data lines (Pins 2-9). This register is normally a write only port. Table 1.1 shows the pin out of the data register.

Table 1.1: Pin Out Of Data Register

Offset	Name	Read/write	Bit Number	Properties	Pin Number
Base+0	Data Port/ Data Register	Write	Bit 7	Data 7	Pin 9
			Bit 6	Data 6	Pin 8
			Bit 5	Data 5	Pin 7
			Bit 4	Data 4	Pin 6
			Bit 3	Data 3	Pin 5
			Bit 2	Data 2	Pin 4
			Bit 1	Data 1	Pin 3
			Bit 0	Data 0	Pin 2

From the table 1.1 also shows the properties for the data register, which is it starting from data 0 to data 7. The total of pin data register is about 8 pin only and it is for parallel port DB 25.

1.6.1.2 Status Register

The Status Port / Status Register (base address + 1) is a read only port. Any data written to this port will be ignored. The Status Port is made up of 5 input lines (Pins 10,11,12,13 & 15), a IRQ status register and two reserved bits. Table 1.2 shows the pin out of the status register.

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Table 1.2: Pin Out of the Status Register

Offset	Name	Read/write	Bit Number	Properties	Pin Number
Base+ 1	Status Port/ Status Register	Read Only	Bit 7	Busy	Pin 11
			Bit 6	Ack	Pin 10
			Bit 5	Paper Out	Pin 12
			Bit 4	Select In	Pin 13
			Bit 3	Error	Pin 15
			Bit 2	IRQ(Not)	
			Bit 1	Reserved	
			Bit 0	Reserved	

From the table 1.2 also shows the properties for the status register, the name of the status register is buzy, ack, paper, select in, error and IRQ. That name is given to the status register because at the beginning creation parallel port mostly use for printer only. The function of the status port is to send the signal to back computer. The total of pin status register is about 8 pin but only 5 can be used.

1.6.1.3 Control Register

The Control Port / Control Register (base address + 2) was intended as a write only port. When a printer is attached to the Parallel Port, four "controls" are used. These are Strobe, Auto Linefeed, Initialize and Select Printer, all of which are inverted except Initialize. Table 1.3 shows the pin out of the control register.

The printer would not send a signal to initialize the computer, nor would it tell the computer to use auto linefeed. However these four outputs can also be used for inputs. If the computer has placed a pin high (e.g. +5v) and the device wanted to take it low, it would effectively short out the port, causing a conflict on that pin. Therefore these lines are "open collector" outputs (or open drain for CMOS devices). This means that it has two states. A low state (0v) and a high impedance state (open circuit). [12]

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