

## Car Parking and Monitoring Using Microcontroller

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### ABSTRACT:

The project aims on reducing the problem of car parking and its monitoring using automation with microcontroller **AT89S52**. In India the problem of parking is rapidly increasing almost in every major city at an alarming rate that it is being ubiquitous. To solve this problem automatic car parking system is designed in which microcontroller, magnetic sensors, DC geared motor, light emitting diodes, and counters etc. are used. This system will help to solve the problem of random or un-organized parking habits by giving each vehicle a particular space to stand. Implementation of this will reduce space required as well as save our time with complete automation.

**KEYWORDS:** Automation, Cost-efficient, Sensors, LCD Display, Microcontroller

### I. INTRODUCTION:

Automatic systems are now being used almost in each and every field. This automation are now being a major part of attraction by people to make their life easy in dealing almost all major sectors i.e., industries, manufacturing, transportation, biomedical facilities, etc.

As automation deals with accuracy, reliability as well as flexibility, seems major concern for the people and automation providing us so and so. Secondly, it prevents the system from human errors. Moreover, an automatic system require minimum running cost as well as requires less maintenance on long run.

In metro cities, parking space is becoming ubiquitous. The increasing number of vehicles on road seems to increase this problem. Multistorey car parking system is being a very good substitute to sort out this problem. The problem is being tackled through this project based on automation using AT89S52 microcontroller.

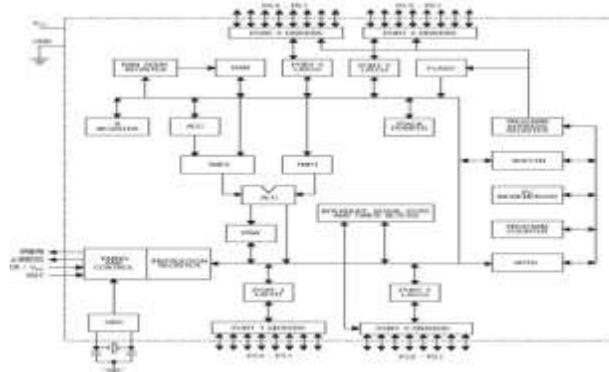


Fig.1 Block diagram of AT89S52

## II. ABOUT THE SYSTEM:

Magnetic sensors are used to sense the presence of the vehicle at the entrance and exit. This will provide the help to microcontroller to keep the record or track of inputs shown with the help of LCD. When the magnetic sensor senses the presence of the vehicle the DC geared motor will open the gate for the entry as well as exit of the vehicle. The time which gets wasted in finding the empty slot for parking is resolved here by using LEDs. Counter as the name suggests its work is to count the number of cars entered and leaved from the parking area. And the counter needs to reset after keeping the records for the single day.

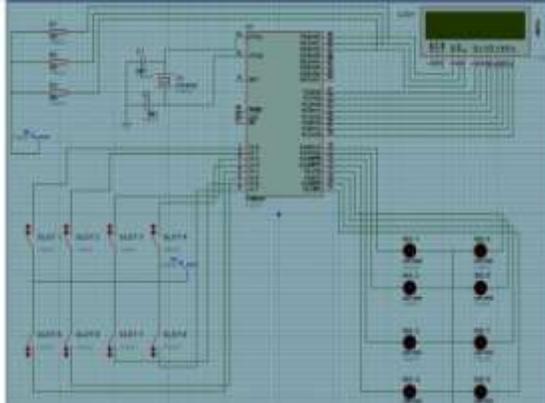


Fig.2 Connection Diagram of the circuit

## III. NEED OF AUTOMATION:

A) Earlier, while talking about the latest technological devices the focus was on the future technological aspects, with which automation could be done practically, but at present it comes in reality.

- A huge amount of human work is replaced by latest technological devices, by the use of such devices the work is much more error free or almost zero error then that which is being done by human in such conditions.
- Human operators are being replaced from the work which involves hard physical or prosaic work by such devices. .
- By having very less space a number of vehicles can be parked.

B) To control car parking slots and to monitor the whole area this automation is very useful.

## IV. TECHNICAL SPECIFICATIONS:

- POWER SUPPLY
- AT89S52 MICROCONTROLLER
- 16X2 LCD
- MAGNETIC SENSORS
- DC GEARED MOTOR
- LEDs
- CD4033BE IC
- POWER SUPPLY:  
@25 Amps-277 minutes, @56 Amps- 110 minutes  
Energy-1.42 KWh  
OUTPUT: 9V, 500mA
- AT89S52 MICROCONTROLLER:

4.0V to 5.5V Operating range 8 bit CPU with registers A & B, 16 bit PC and Data Pointer, Fully static operation: 0 Hz to 33 MHz Internal RAM of 128 bytes, and 32 I/O pins.



Fig.3 Microcontroller and LCD display used in project

- **MAGNETIC SESNSORS:**  
Internally shielded 40°C to 70°C,  
Rated load speed: 89 rpm
- **16x2 LCD:**  
2 rows 16 character, Register Select (R/S). RS=0:  
COMMUNICATION;  
RS=1: DATA  
Read/Write(R/W). RW=0: WRITE;  
RW=1: READ.
- **CD4033BE IC:**  
Counter and 7 segment decoding in single package  
Parametric ratings: 5V, 10V, 15V.

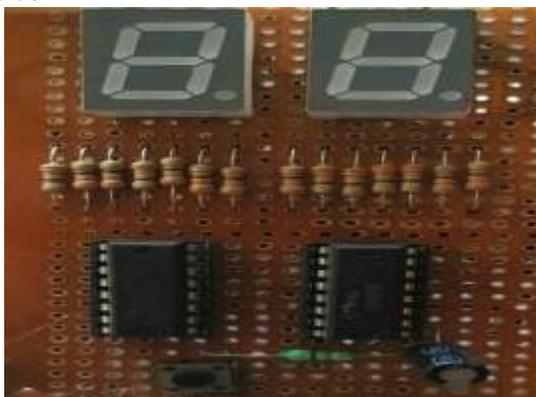


Fig.4 Showcase of counter and display device

## V. DESCRIPTION OF WORKING MODEL:

This system for instance has 5 slots and in each of them a magnetic sensor is placed, these sensors sense the presence or the absence of the car. According to the output of sensors the LED is operated. For each slot 2 LED's are placed one is red and another is green, the red LED shows that the space for parking in not ready or the slot is not empty. The red LED also shows that which of the space is filled, this helps the user to identify where else the person can park their respective vehicles, and not only this there is a green LED which tells which slots is ready to use and it provides the guidance to reach through the slots.



Fig.5. Prototype Working Model of Project

The LCD screen of 16x2 shows the number of slots empty and also what the current status of car parking system is. All red LED's are placed on the left side of the LCD screen and these all are connected with the microcontroller.

Two DC motors are also used which are placed at the starting and at the ending of the system these two motors operates through two different sensors which are placed on adjacent to the motors. These sensors makes motor run.

Power source for this system is 9V DC battery. It requires 2 batteries for smooth running of the mini system, one of the batteries provide power to microcontroller, sensors and to LCD, and another battery provides power to both the motors. For future and use at big stages Ac power will be efficient.

#### VI. KEY FEATURES OF THE PROJECT:

- Cost effective
- Saves time.
- Provides safety.
- On Board LCD Display.
- Reduces human error.
- Works with better efficiency.
- Reduces the need of additional manpower.
  
- Controlling the devices using microcontroller.
- User Friendly Interface.

**VII. CONCLUSION:**

This project is expected for a cost effective and an efficient solution to the problem of effluent car parking. The project would be very significant in the near future as in India the car parking system using microcontroller automation is not established that much & this technology needs to be developed where this project could be used as a reference for further advancements.

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