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Design of Security System for Conference Hall

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ABSTRACT: Energy crisis is a significant issue that is becoming increasingly important in the supply of energy resources to an economy. So the conservation of energy is relevant for sustainable development of energy resources. The objective of this paper is to overcome this problem. In recent years, the home environment has seen a rapid introduction of network enabled digital technology. Auto Control Electrical Appliance with security Indication is one of the automated technology used for these purposes which is based on Microcontroller. It is a reliable circuit that takes over the task of controlling the Electrical appliances mainly lighting in Conference Hall with unauthorised persons entry. The system includes Touch sensor, microcontroller, LCD, a metal detector module, LED and a power supply, which uses a compact circuitry built around microcontroller. This scheme not only saves the valuable energy but also provides the security benefits to prevent the unauthorized access inside the hall.

KEYWORDS:Microcontroller 8051, LCD, Touch Sensors, Metal Detector Module.

I. INTRODUCTION

Automation or automatic control is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens, switching in telephone networks, steering and stabilization of ships, aircraft and other applications with minimal or reduced human intervention. Some processes have been completely automated. The biggest benefit of automation is that it saves labour, energy and materials to improve quality, accuracy and precision.

In this paper the scheme has been proposed to save the power consumption in electrical equipment mainly lighting system and adopting security system to prevent the unauthorised access.

The touch plate has been interfaced with microcontroller to provide actual movement instruction for the accurate result.

Microcontroller allows dynamic and faster control. The Liquid crystal display (LCD) makes the system user-friendly, which displays the total person present in the hall. Microcontroller is the heart of the circuit as it controls all the functions. Person counting is simply a measurement of the visitor traffic i.e. enter and exit. Counting the persons help to maximize the efficiency and effectiveness of meeting of an organization. All the components required are readily available in the market and the circuit is easy to build. A buzzer is provided for metal detector and detection of extra person.

The system uses a compact circuitry built around AT89C51Microcontroller Program has been developed in Embedded C. Flash magic is used for loading programs into Microcontroller.

II. LITERATURE SURVEY

To make smart conference room fully automated, a system which controls the light and AC of conference room has been made. This system works in the presence of employees or persons [1]. Energy crisis is the main problem that we are facing nowadays. So, electricity should be conserved otherwise next generations may have to live without Electricity. To overcome these problems a smart conference hall has been designed using microcontroller [2]. In between 1915 and 1920 electrical home appliance introduced. The smart home's history can be easily traced back to the early turn of the century, where electrical and telephone wiring was installed in new houses [3]. Liquid Crystal Display

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(LCD) consists of rod-shaped tiny molecules sandwiched between a flat piece of glass and an opaque substrate. These rod-shaped molecules in between the plates align into two different physical positions based on the electric charge applied to them [4].

N.B.Bhawarkaret. al. worked on LPC 2138 ARM 7 controller, This LPC 2138 is interfaced with the Zigbee receiver and PIR sensor through relay. An EEPROM is used to store the present message in case if the failure of power is occurred. A 20×4 LCD display is used to display all types of messages [5].The LM7805 will regulate the given voltage to 5V for supplying to the PIC16F876A and pull up the push button. The purpose of using diode is for circuit protection, in case the polarity of the power source connection is incorrect. Capacitor is used to stabilize the voltage input and output of the LM7805. Red LED acts as a power indicator [6].Smart Home can be also known as Automated Home or intelligent home which indicates the automation of daily tasks with electrical appliances used in homes. This could be the control of lights, fans, viewing of the house interiors for surveillance purposes or giving the alarm alteration or indication in case of gas leakage [7].

Vaibhav Bhatia et. al. has been done the simulation of the system on Proteus Professional Software v8.0. PIC16F877A microcontroller based on Modified Harvard architecture is used in the system. Programming of the system has been done in Embedded C language.16*2 LCD display has been used which is connected to the microcontroller [8].

III. FLOW CHART OF PROPOSED SYSTEM

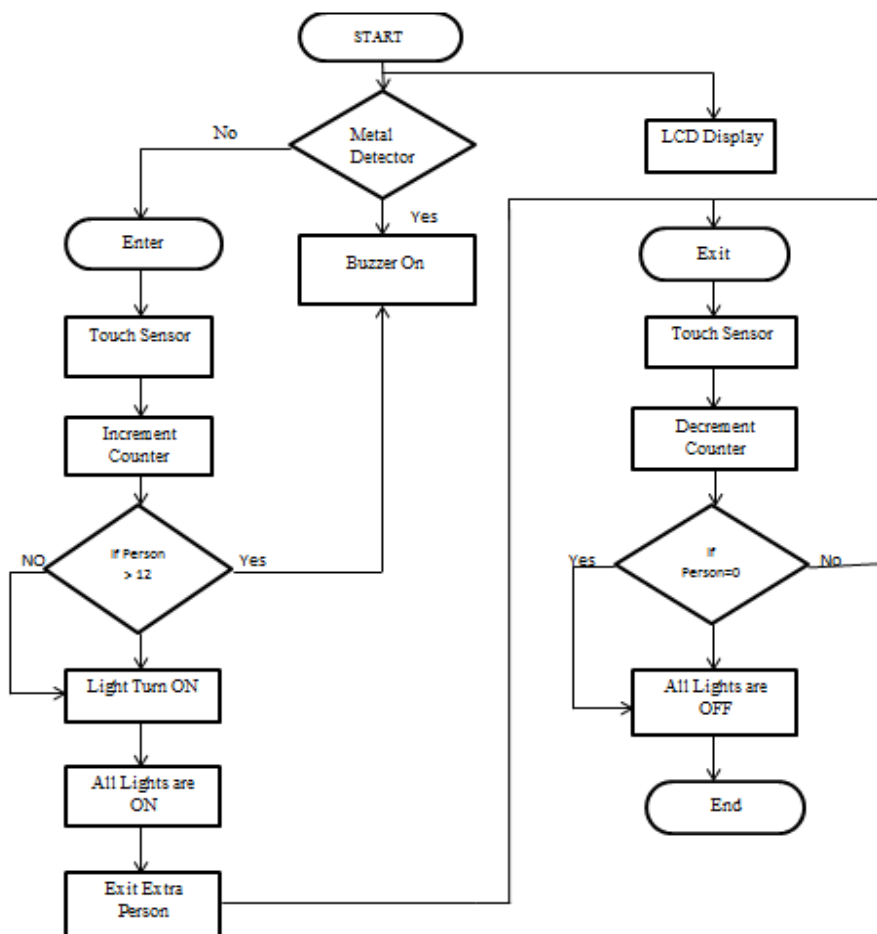


Fig: 1Flowchart of proposed system

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IV. SIMULATION MODEL

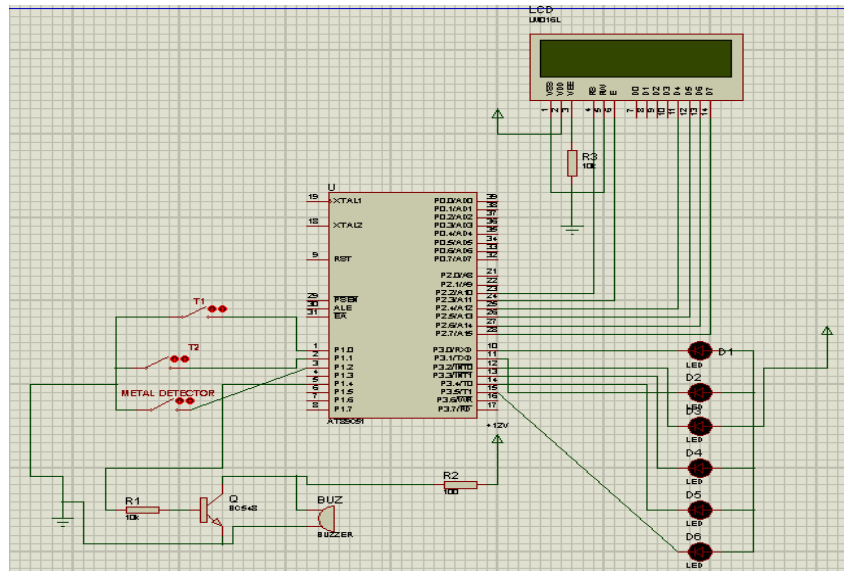


Fig: 2 Simulation model

Simulation model has been developed in Proteus software. In this simulation saving of power consumption in electrical equipment mainly lighting system has been proposed. The simulation circuit consists of touch sensor, metal detector, buzzer and LCD display. One switch has been used for the metal detector and for touch sensor two switches have been used, one for entrances and other one for exit. Six LEDs have been connected with AT89C51 Microcontroller to pins P3.0, P3.1, P3.2, P3.3, P3.4 and P3.5. P1.0 and P1.1 of Port 1 have been connected to touch sensor. For metal detector P1.2 has been used. Buzzer has been connected to P1.4 of Port 1. Six pins of LCD have been connected with microcontroller through pins P2.2, P2.3, P2.4, P2.5, P2.6, and P2.7. LM016L type of LCD has been used in this simulation. For transistor bc548-npn model has been used.

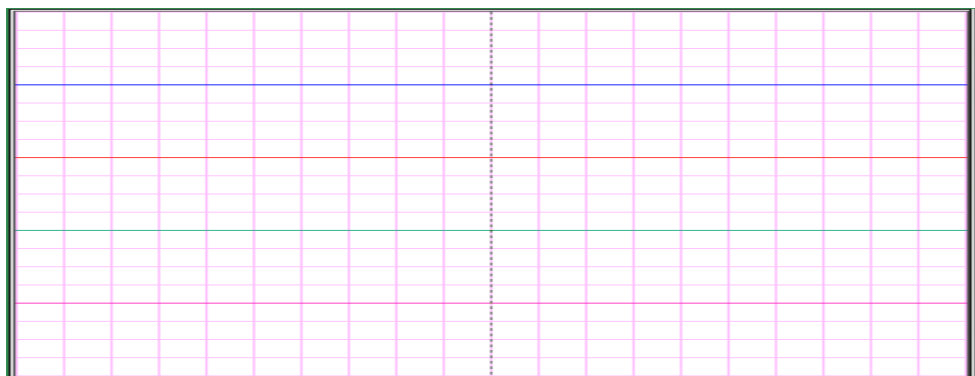


Fig: 3 Software output when One LED is ON

Fig.3 represents software output when one LED has been ON. Fig.4 represents software output when six LEDs have been ON.

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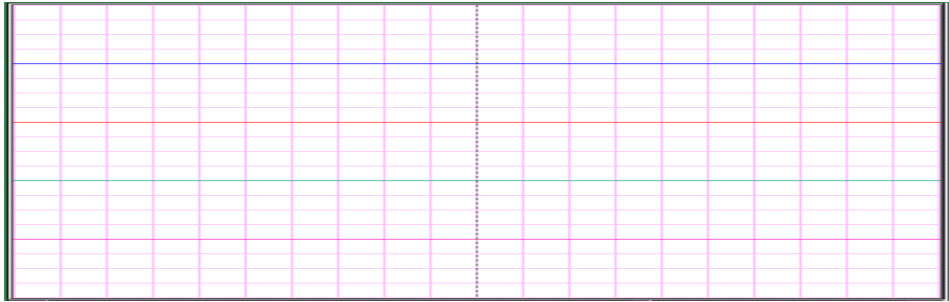


Fig: 4 Software output when Six LEDs are ON

V. HARDWARE IMPLEMENTATION

In hardware there is a metal detector module inbuilt with entry gate to prevent the unauthorized access in the hall. There is also a touch sensor which controls the switching on/off of the light, when it detects the person entered into the conference hall. The microcontroller receives the signals from the touch sensors, and this signal is operated under the control of software which is stored in AT89C51. A LCD has been used to display the total number of persons present in conference hall. If total person exceed from its capacity then a buzzer will indicate about this.

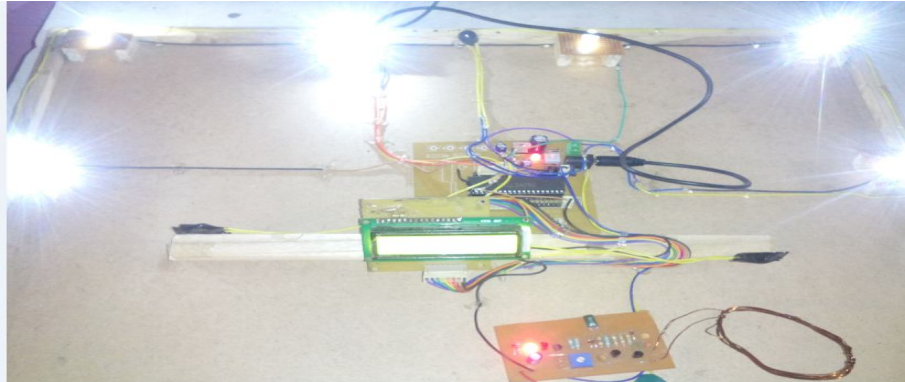


Fig: 5 Embedded Control Hardware Circuit

VI. RESULT AND ANALYSIS

Table(1): Pin Connection with LED

Sl.no.	Pin no.	Counter Values (no. of person)	Lights ON
1	P3	0	All Lights OFF
2	P3.0	1	D1
3	P3.1	3	D1 & D2
4	P3.2	5	D1, D2, & D3
5	P3.3	7	D1, D2, D3, & D4
6	P3.4	9	D1, D2, D3, D4, & D5
7	P3.5	11	D1, D2, D3, D4, D5, & D6

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The metal detector will detect that person only who is having any metal element and the buzzer will beep. After metal detector there is a touch sensor which counts number of person entering to the conference hall and display it on LCD, which has been interfaced with touch sensor and also the lights of the hall have been ON simultaneously. The buzzer will beep continuously if number of person exceeds more than its capacity. And the last step is to exist from hall. For this, there is a touch sensor on exist gate. As the persons go out the lights have been OFF automatically.

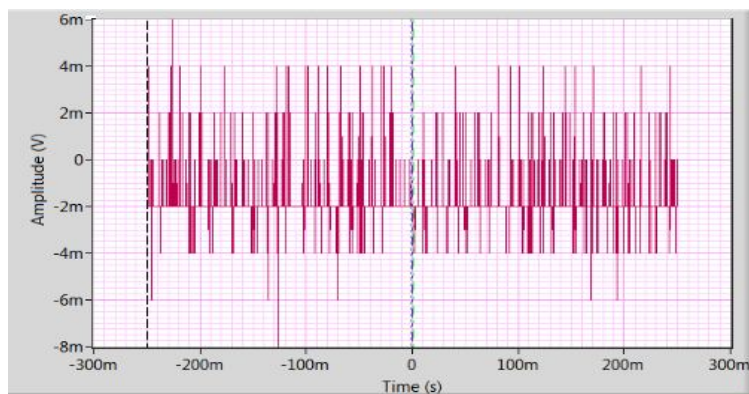


Fig: 6 Output when One LED is ON

Fig. 6 represents hardware output when one LED has been ON. This is the graph between LED voltages versus time. Fig. 7 represents hardware output when six LEDs have been ON.

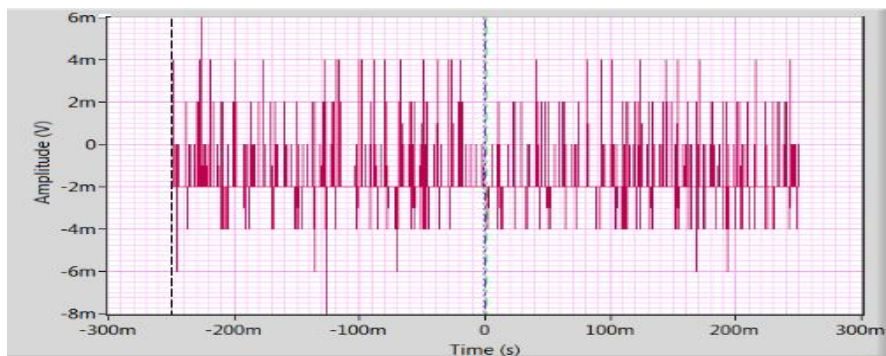


Fig: 7 Output when Six LEDs are ON

VII. CONCLUSION

The development of this system fulfills the objectives of reducing the required man power, time and loss of electricity. It has been concluded from results that, this method not only saves the valuable energy but also provides the security benefits to prevent the unauthorized access inside the hall. It can be used in several concern locations for both purposes, where there is the requirement to check the person's entry or exit. This technique has been utilised to minimize the labour cost such as persons required for switching ON/OFF the lights each time in the hall and also reduced the risk of unexpected mishapings due to manual operation.

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