iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 6 **Issue:** VI **Month of publication:** June 2018

DOI: http://doi.org/10.22214/ijraset.2018.6177

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 6 Issue VI, June 2018- Available at www.ijraset.com

Automated Power Saving Conference Hall System using Global System for Mobile Communications(GSM)

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Abstract: ***In this paper we have proposed conference hall automation system. We have used optimum energy management concept. When any person enters the conference hall, system senses and accordingly operate the lights and fans and saves energy. Also we have used GSM module which is interfaced with the controller. Security against fire is added, fire alarm system is activated when it detects fire and dials a call from the connected phone. The principle used is very easy and simple to implement. Hardware required for the design is not very costly and easily available in the market.***
Keywords: GSM (Global System for Mobile),Automation,Optimum energy management concept

I. INTRODUCTION

Home automation [1] means the automated home i.e. controlling the lighting appliances, HVAC (Heating, ventilation and air-conditioning) appliances and other electrical devices over the GSM enabled phone. This system [2] is to implement a microcontroller-based control module that receives its instructions and command from a cellular phone over the GSM network [5].
This system uses led light that have optimum energy management concept. It means this system have two sensing gate such as enter gate and exit gate. When any person enter into conference hall system sense and according to person system operate the light and save the energy. In this system we want to demonstrate the idea of advance fire detection and alerting system. In this system we use fire sensor that senses the fire and weeps the buzzer. It uses the GSM info-provider system [7,8]. It also uses darling ton pair of transistor that provide the GSM calling feature at respective number using GSM mobile.

II. LITERATURE REVIEW

Today in the market, there exists system neither at cheaper rates nor easy to handle. Various systems are hard to install, difficult to use and maintain. Current systems are generally proprietary, closed and not very user friendly. Nowadays, many organizations have their own system to manage visitor entering their premises [6]. Common practice is by registering and recording visitor information in a logbook. This registration activity has some weaknesses such as there is a possibility of misplacement of visitor logbook during guard shift exchange, visitor information in logbook is exposed to every visitor and difficult to read and search hand written visitor logbook. Hence we developed a cost effective, easy to use and a responsive system for all types of users.

III. HARDWARE AND DESIGN

A. Design Overview

The design demonstrated here, has 4 modules. The first module is “Visitor counter”, the second module is “Automatic room light and fan controller”, the third module is gsm circuit and the fourth one is fire alarm system. Visitor counter is used to determine and display the number of persons entering in and getting out from any room
The automatic room light and fan controller is used to turn ON/OFF the home appliance. When the number of persons within the room is zero, light and fan stays OFF. When persons are present, the light and fan made ON.
The advance fire detection and alerting system uses the fire sensor that sense the fire and weep the buzzer.
The GSM info-provider system uses darling ton pair of transistor that provide the GSM calling feature at respective number using GSM mobile.

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B. Block Diagram

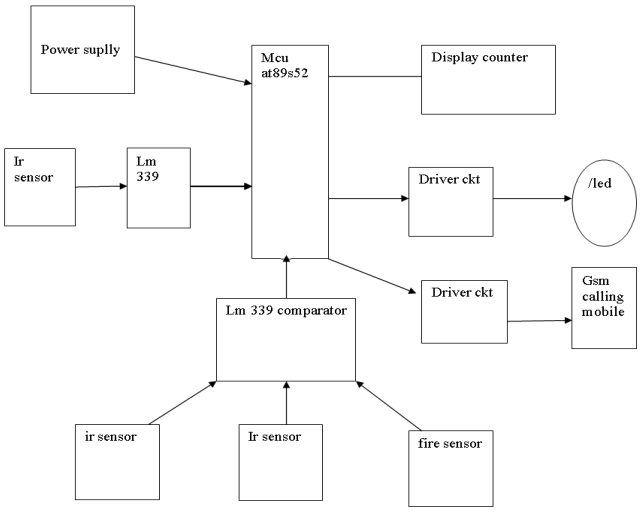


Figure 1:Block Diagram

C. Circuit Diagram

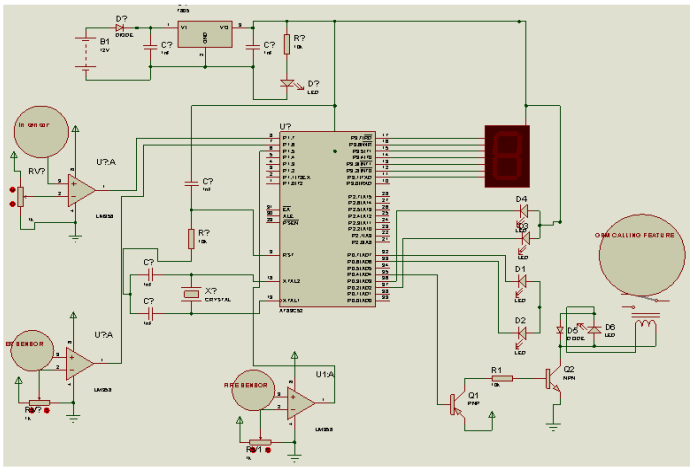


Figure 2: Circuit Diagram

D. Hardware

1) *Power supply:* All digital circuits require regulated power supply. In this article we are going to learn how to get a regulated positive supply from the mains supply.

2) *AT89S52 Microcontroller*

a) low-power, high performance CMOS 8-bit microcontroller with 8KB of Flash Programmable and Erasable Read Only Memory (PEROM) and 256 kb of RAM.

b) Dual data pointer

c) 32 Programmable I/O lines.

d) 16 bit Timer/Counter—3.

e) 8 Interrupt sources.

f) Three level program memory lock

g) Full duplex UART serial channel

h) manufactured using nonvolatile memory technology

i) The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer.

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E. Crystal Oscillator

A crystal oscillator is an electronic circuit that uses the mechanical resonance of a vibrating crystal of piezoelectric material to create an electrical signal with a very precise frequency. This frequency is commonly used to keep track of time (as in quartz wristwatches), to provide a stable clock signal for digital integrated circuits, and to stabilize frequencies for radio transmitters and receivers. The most common type of piezoelectric resonator used is the quartz crystal.

F. Resistors

A resistor is a two-terminal electronic component that produces a voltage across its terminals that is proportional to the electric current passing through it in accordance with Ohm's law:

V = IR

G. Capacitors

A capacitor or condenser is a passive electronic component consisting of a pair of conductors separated by a dielectric (insulator). When a potential difference (voltage) exists across the conductors, an electric field is present in the dielectric. This field stores energy and produces a mechanical force between the conductors.

H. Zero PCB Plate

PCB is a platform where many of the embedded systems to be made. PCB (Printed Circuit Board) is used for the assembly of various components on a single plate. The connections on the PCB should be identical to the circuit diagram, but while the circuit diagram is arranged to be readable, the PCB layout is arranged to be functional, so there is rarely any visible correlation between the circuit diagram and the layout.

I. Description Of IR Sensor

This circuit is one of the most basic and popular sensor modules. In electronics, this sensor is analogous to human's visionary senses which can be used to detect an obstacle which is one of its common applications. In robotics, a group of such modules are used so that a robot can follow a line pattern. The transmitter part of the sensor is an Infrared (IR) Led which transmits continuous IR rays to be received by an IR receiver. The output of the receiver varies depending upon its reception of IR rays. Since this variation cannot be analyzed as such, therefore this output can be fed to a comparator.

J. Diode

A simple Diode is the simplest two-terminal unilateral semiconductor device. It allows current to flow only in one direction and blocks the current that flows in the opposite direction. The two terminals of the diode are called as anode and cathode.

K. Infrared(IR) Led

An IR LED, also known as IR transmitter, is a special purpose LED that transmits infrared rays in the range of 760 nm wavelength. Such LEDs are usually made of gallium arsenide or aluminium gallium arsenide. They, along with IR receivers, are commonly used as sensors.

L. Seven Segments

A seven-segment display is the most basic electronic display device that can display digits from 0-9. They find wide application in devices that display numeric information like digital clocks, radio, microwave ovens, electronic meters etc. The most common configuration has an array of eight LEDs arranged in a special pattern to display these digits.

M. GSM Module

For sending message GSM module SIM300 is used. It accepts the commands serially from micro-controller. It uses AT commands to work. A GSM modem is a specialized type of modem which accepts a SIM card, and operates just like a mobile phone.

N. Fire Sensor

A flame detector is a sensor designed to detect and respond to the presence of a flame or fire, allowing flame detection. Responses to a detected flame depend on the installation, but can include sounding an alarm.

IV. IMPLEMENTATION

The microcontroller receives the signals from the sensors, and this signal is operated under the control of software which is stored in ROM. The software also controls the relay driver which controls the lights. If the sensor 1 is interrupted first then the microcontroller will look for the sensor 2, and if it is interrupted then the microcontroller will increment the count and switch on the

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relay, if it is first time interrupted. If the sensor 2 is interrupted first then the microcontroller will look for the sensor 1, and if it is interrupted then the microcontroller will decrement the count. The fire buzzer is connected with the GSM circuit and a headphone. When the fire is detected, GSM circuit automatically dials the call.

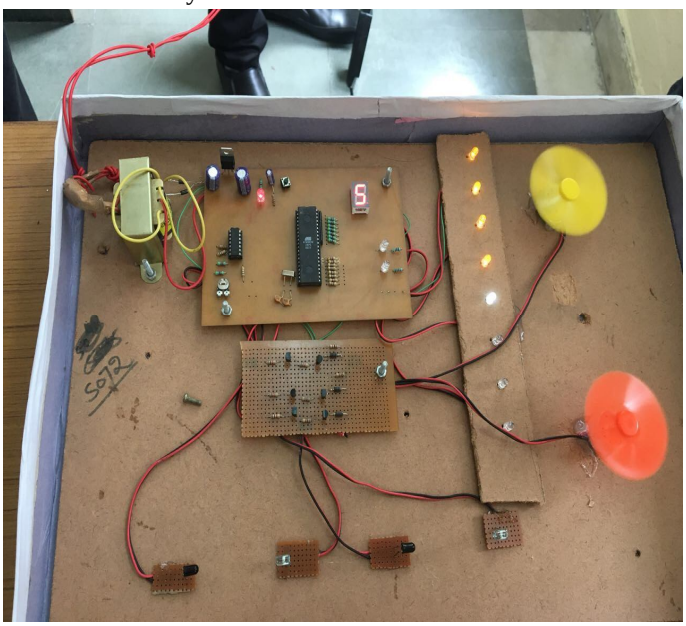


Figure 3: Circuit Picture

V. ADVANTAGES AND DISADVANTAGES

A. *Advantage*

1) This idea is applicable in real life application.
2) Cost effective in production level.
3) User friendly.
4) It provides less effort for human.
5) It provides more accuracy compare to human.
6) This system is compatible and portable.

B. *Disadvantage*

1) Initially less cost effective but for production level it more cost effective.
2) User must have operating knowledge.
3) Circuit is complicated.
4) Programming and circuit is required.

VI. RESULT AND CONCLUSION

We have designed and implemented a Bi-Directional Counter & Home Automation using the concept of Embedded System.
From the concept of Bidirectional visitor counter, it is easy to minimize power consumption and also it is low in cost. Electricity usage is minimized by the automatic switching ON/OFF of lights and Fans based on visitor's count.

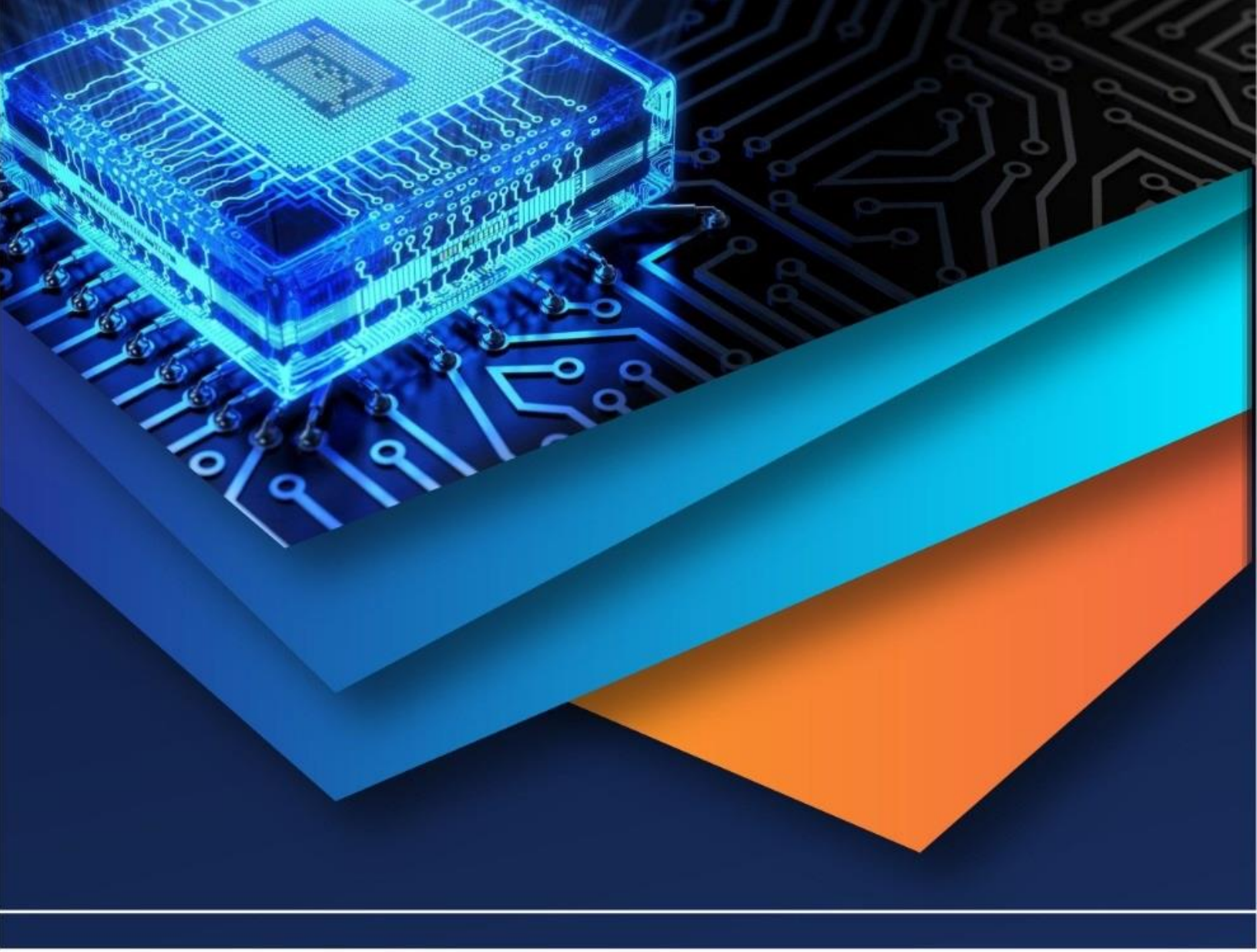
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