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Automatic Room Light Controller with Visitor Counter and GSM Messaging

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***Abstract*—**Now days it is essential to develop electricity with renewable sources or required to save energy, because of low creativity and high demand of electricity. 12Mega Watt energy was sufficient above 60 years ago, but now days this number is very big (approximately 1.5 million Mega Watt). Many times we forgot to switch off the light or fan or other home appliances, due to which there is large waste of electricity.

To save the electricity we are going to implement this project named as "Automatic Room Light Controller with Visitor Counter and GSM Messaging". It automatically count the number of person enter or exit the room and depend on counter value it automatically turn on or off the lights of room.

To show the Count value we use the 7-Segment display and the GSM is used to transmit the count value on allowed mobile number as a message "count=___".This project can be used for security purpose.

Keywords- *Introduction, Literature review, Aims and Objective, Block diagram, Flow chart, Working, Advantages, Disadvantages, Applications, Conclusion, Future scope.*

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I. INTRODUCTION

The main purpose of this project is to save the unwanted wastage of electricity which happened due to human mistakes like forgot about turn off the fan switch when there no one present in the room.

This project is microcontroller based project which is easy to implement, and it reduces the human efforts. we know, now days there is continuous requirement of automatic home appliances like IoT devices which are mainly used in automation sector.

This "automatic room light controller with visitor counter and GSM messaging" project has mainly three parts --- first part is about that it count the number of person present on the room and it will show the count value on 7-Segment display. The secont part is about automatic room light control, if there count=0, then microcontroller will automatically turn off the light and if count>=0, then it will automatically turn on the light.

The third and last part of project is GSM messaging which is used to inform the count value which is displayed on 7- Segment display is send on particular mobile number as a message (student count ==___). When the project is turn on after some time (which is set by user/as per requirement) message will be send on mobile using a GSM module interfacing with microcontroller. Through which we can get a information anywhere about how many persons present in the room?

II. LITERATURE REVIEW

Automatic Room Light Controller with Visitor Counter and GSM messaging project is microcontroller based project which is easy to implement and it counts the number of person enters and exits the room and display the count on 7- Segment display. If someone enters into the room the counter value is incremented by one per entry and if someone exit outside the room then counter value is decremented by one per exit. When the number of person present in the are equal to zero then the microcontroller will turn off the light automatically and if there is only one person or more than one person are present in the room it will turn on the light automatically. Also it will send the status of counter automatically on particular mobile number which is set in programing by programmer.

III. AIM AND OBJECTIVE

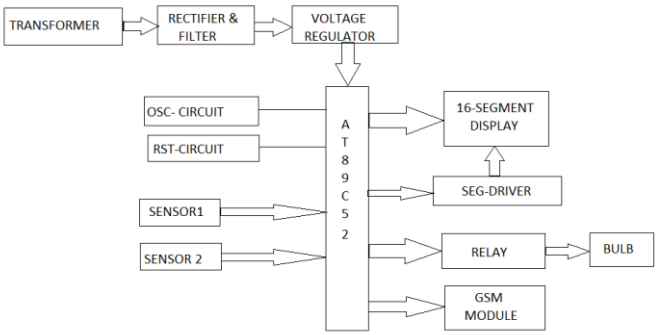
A. *Aim*

The main aim of this project is used to counting the number of persons present in the room and Also this project is used send the counter value on particular mobile number as a message "Count=___".

B. *Objective*

1. For counting the number of persons present in the room.
2. For automatic room light/fan control.
3. For security purpose also it uses GSM messaging.

IV. BLOCK DIAGRAM



A. *Power Supply*

Here microcontroller, 7-segment, LED indicators and operates with DC 5V. Relay and GSM modem operates with 12VDC supply and this supply is provided by 12V DC , to obtain, we required to convert AC230V supply in to 12V-0-12V by step down transformer and rectifier required to convert it in to DC 5V.

B. *Microcontroller*

We used here 8051 series AT89C51/52 microcontroller in which, external crystal required, reset required, it works on 3.5V to 5V it has 4-8 bit ports and it has program memory up to 4Kb/8kb program memory and operating frequency up to 20MHz clock frequency.

C. *Reset and Oscillator Circuit*

Any microcontroller requires oscillation frequency for its operation it can be internal for few microcontrollers has external also. This microcontroller requires external oscillator frequency.

Reset circuit requires for the restart program from beginning it used when microcontroller hangs or if we required to stop the running condition with beginning process.

D. *7-Segment Display*

7-segment displays are used to show decimal counts, that counts can be controlled with digital or microcontroller IC. We have connected two different ports to obtain counts up to 99. Port 0 and port 2 are connected with current driver IC ULN2003 for BIG 7-Segment display.

E. *Sensors*

Enter and exit sensors are developed with monostablemultivibrator with 2 seconds time period for each interrupt. We can use LDR/ IR/ LASER sensors for detecting counts. Depending upon requirement we can place these sensors in proper manner with door frame.

Relay driver is building NPN transistor in common emitter mode as transistor ON-relay ON and vice versa.

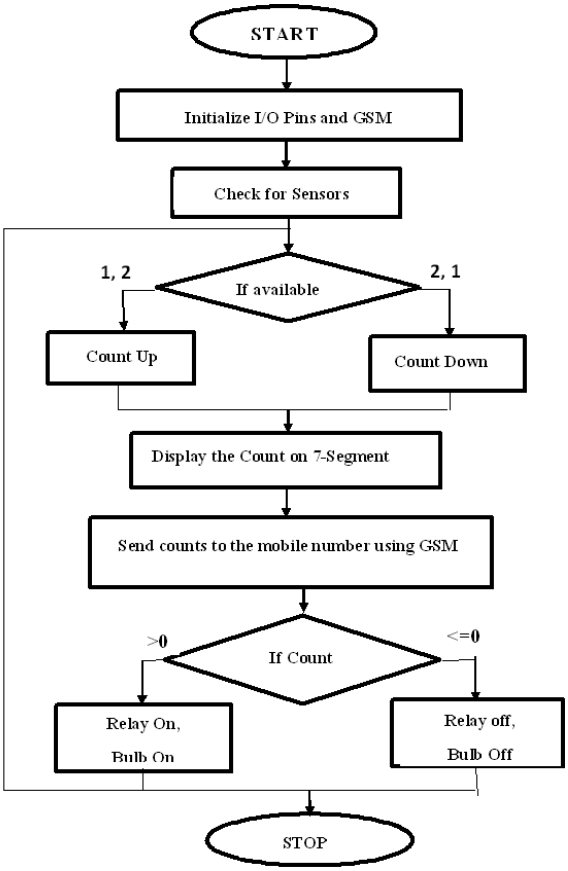
F. *GSM Modem*

GSM/GPRS Modem-RS232 is built with Dual Band GSM/GPRS engine- SIM900A, works on frequencies 900/ 1800 MHz. The Modem is coming with RS232 interface, which allows you connect PC as well as microcontroller with RS232 Chip(MAX232).

GSM is used here to interface with microcontroller and microcontroller command to the GSM modem with AT (abbreviation of ATtention) command set implemented in our program.

GSM is used here to send the count value on given mobile number.

V. FLOW CHART



VI. WORKING

1. When project is turned ON, It automatically initializes I/O pins and GSM. After that it checks sensor's output.
2. If the sensor 1 detects first and then sensor 2 detects, the microcontroller will count up / increment the count and displayed on 7- Segment display.
3. If the sensor 2 detects first and then sensor 1 detects, the microcontroller will count down / decrement the count and displayed on 7- Segment display.

4. The counter value is then send on mobile number using GSM module after some time which set by user in program.
5. If the counter value is >0, then microcontroller will turn ON the Relay and bulb.
6. If the counter value is <=0, then microcontroller will automatically turn OFF the relay and bulb.

VII. ADVANTAGES, DISADVANTAGES AND APPLICATIONS

A. *Advantages*

- The circuit required power supply for operation is very less. (12V DC, 750mAh)
- The component required for this hard ware is easily available in market, and well in rate.
- The circuit is compact in size, so small space is required.

B. *Disadvantage*

- When two person cross simultaneously IR sensor light, then this project count it as one value, so in that case we cannot use this project.

C. *Applications*

- It can use in industries as automatic control.
- It can be used in automation system also, to control lights or any electrical appliances.
- It can be used in home use also, to control temperature and lights also.
- It can be used to security purpose by implementing little other hardware.

VIII. CONCLUSION AND FUTURE SCOPE

A. *Conclusion*

Now days, there is more requirement of automatic appliances to make the life more easy. This automatic room light controller with visitor counter and GSM messaging project provides the automation for light control purpose. It count the number of person present in the room and shows on the display. If there is no one present in the room it automatically turns off the light.

We can implement this project in college's classroom which count the students present in classroom and as per set time it send the student count on mobile number of head to inform about, how many students are presented? It also control the lights or fans of classroom.

B. *Future Scope*

- Fan is parallel connected to the light as light and fan ON at a time to indicate someone is entering in the room and temperature also shows on LCD display.
- By using two relays we can implement this project for opening and closing of door automatically.

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