Microcontroller based Automatic room lock and lights system.

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Abstract— This system used to count up to nine persons present in the rooms and indicated on display. After counting and indication it automatically locks the door and switches of the lights as soon as they leave the room. It automatically switches on the lights when the first persons enter the room. This circuit can be used as power saving device and a security device to prevent unauthorized entry in the room, especially in the business meeting room. The scope of this booklet is to discuss these various factors and there importance. The circuit, is built around three NE555 timer ICs.(IC1, IC2, IC6), an up/down BCD decade counter 74LS192 (IC3), a seven segment display driver 74LS47 (IC4), 4-input NOR gate HEF4002B (IC5) and a common anode 7- segment display LTS542(DIS1). S1 and S2 are foot switches. S1 is installed under door-mat of the door to enter the room and S2 is installed under a door-mat just inside the room.

Keywords— ***Home automation, Timer, Microcontroller.***

Introduction

Our contributions to the society are times fuel by personal experience complemented by knowledge of a particular field of study. Electronics system refines, extend or supplement Human facilities and ability to observe, preserve, communicate, remember, calculate or reason. Electronic systems are classified as either analog or digital. Analog system change their signal output linearly with the input and can be represented on a scale by means of a pointer. On the other hand, digital instruments or circuits represent their output as two discrete levels (‘1’ or ‘0’) and could show their output in a digital display either numerically or alphabetically. The need for automation has come to stay and this date back to 1500 years when the first water pump for metal working rolling mills for coinage strips was developed [1] from then till date the automation world has continued to grow tremendously. Automation is the art of making processes or machines self-acting or self-moving, it also pertains to the technique of making device, machine, process or procedure more fully automatic, it is a self-controlling or self-moving processes. Automation is usually characterized by two major principles (1) mechanization , i.e. machines are self-regulated so as to meet predetermined requirements (a simple example of self-regulation can be found in the operation of thermostatically controlled furnace); (2) continuous process i.e. production facilities are linked together , thereby integrating several separate elements of the production process into a unified whole. Automation in the electrical, electronics and computing world has grown rapidly of which it dates back to 1940 when the first electronics computing machine was developed. This has aided humans as it basically reduces/eliminates human intervention, of which automatic light switching system also makes the list of which automatic light switching system also makes the list of automation in the electro-computing world. Switch which is one part of this work may be the most ubiquitous mechanical devices in our Technological society. Most every machines needs to be turned on or turned off at some point and that’s typically done by activating a switch. There are an incredible variety of switches. The most basic electrical switch completes or breaks a circuit depending upon what position it is in. Back in time we recall constructing science systems or experiments that required us to build a small electrical circuit that included a battery and a flashlight bulb. When the simple switch was moved. It completed the circuit and the bulb would glow. For this system design, the principle behind this is that when a person enters a room, a light switch placed at a particular location gets a pulse and the light comes ON and when the person goes out , the same switch gets another pulse and the lights goes OFF. The room light controller has a lot of domestic applications and besides, power is seriously conserved when using the unit since the light in the room is automatically switches off when nobody is in the room is automatically switched off when nobody is in the room. The other part of this work which is the automatic door lock operates basically in conjunction with automatic light switch of which it uses a motor for the locking. The locking of the door occurs when the same switches placed at a particular location of the door is switched by greater than 9 persons. A motor is incorporated to drive the system on breakage of a pulse at the receiving end. The mechanical arrangement of the door is done such that the door lock open with the control of D.C motor and metal bearing mechanism automatically

upon switching of somebody entering the door when the switch is switched .this system has both financial and security benefits:

1. **Financial savings:** By setting lights to come on only at certain times, you can reduce utility bills, and
2. **Security:** with this kind of device, you can link lights to a timer so they come on when it gets Dark. You'll never have to return home to a dark house.

I. SYSTEM BLOCK DIAGRAM:

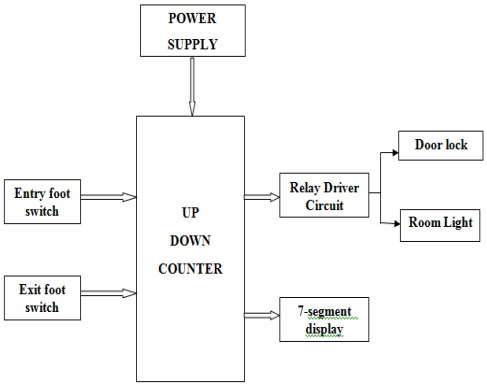


Fig. 1 block diagram of system

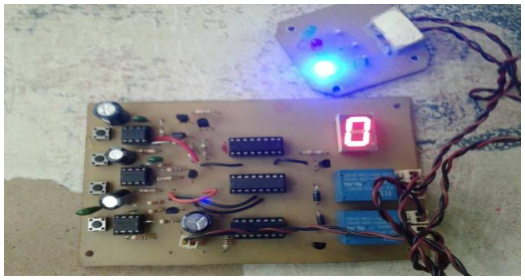
The block diagram of automatic room lock and circuit diagram is as shown above in this diagram the up down counter, relay driver circuit , lock and light , foot switch for up and down counting are shown. The Enter and exit block shows the entry in the room. The output of the foot switch is given to the up down decade counter. Then the output of the up down counter is given to the relay driver circuit which controls the light and lock automatically. If the room is vacant the room lights are OFF and lock is closed. If any person enters in the room the lights ON automatically. Also the output of the up down decade counter is also given to the BCD to 7-segment display which shows the number of people(s) in the room.

II. RESULT

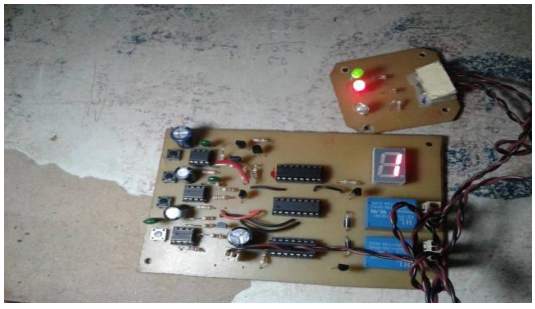
Assumptions:

1. Blue LED indicates room lock.
2. Red LED indicates room lights.
3. Green LED indicates the room is not vacant.

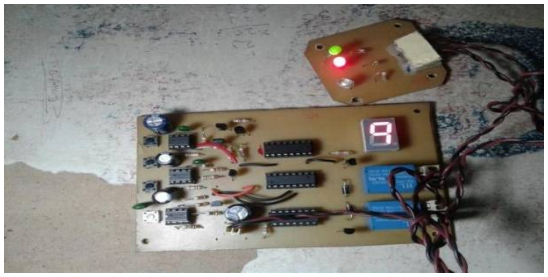
a. If the room is vacant then display shows "0" and the door is LOCKED and ROOM LIGHTS are OFF.



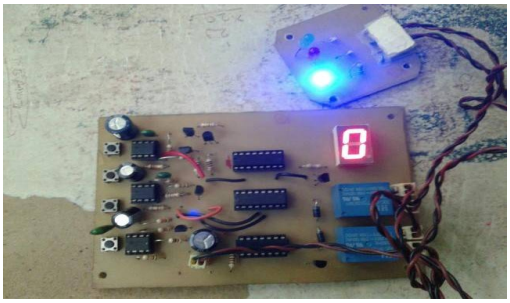
b. If the 1st person enters the room then display shows "1" and the DOOR is UNLOCKED and ROOM LIGHTS are ON.



c. If the 9th person enter the room then display shows "9" and the DOOR is UNLOCKED is UNLOCKED and ROOM LIGHTS are ON.



d. If the 10th person tries to enter the room then display shows "0" and the door is LOCKED and ROOM LIGHTS are OFF.



CONCLUSIONS

The paper presents a theoretical model and a system concept to provide automatic room lock and

light circuit. In this project, we present a 1 st step towards the goal that will be helpful for the businessman in their day to day life. And will make them comfortable while meeting or discussing with specific persons. As the name suggests, it can control the room lock and lights also. The light can also work on 5V battery consuming less power. Experimental results show that, we are not completely successful at achieving our goal of having the range of specific persons more than 9 peoples due the use of hardware components. Though within a small range persons we have completed our goal of being able to enter 9 persons exactly.

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