AUTOMATIC ROOM LIGHT CONTROLLER AND VISITOR COUNTER USING MICROCONTROLLER

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ABSTRACT

The electronic device nowadays is rapidly taking its best position to ease the human complexity of living life. As per the concern of the human disabilities in keeping counter of everything happening in and around the world we limit this project to you to increment the functioning of the visitors through the light controlling system which we wind up naming "automatic light controller with visitor counter". The audacity of this project will not only give a count of the person entering the room but will also light up according to the individuals entered. We set up the program in such a way so that each individual when undergoes this system will leave a mark through the counter and lighting up the seven segment display. This project will negotiate as well as cooperate to its level best if we put in better action and give it a better way of exposure.

The Project 'Automatic Room Light Controller Using microcontroller ATMEGA16A and bidirectional visitor counter' controls a room light as well as count the number of individuals entering and leaving a room. When an individual enters into a room then one counter is incremented by one and one light in a room will be switched ON and when the individuals leaves a room then the counter is decremented by one.

Keywords: Microcontroller ATMEGA16A, IR Sensors, LCD, Counters.

INTRODUCTION

This Project Automatic Room Light Controller with Bidirectional Visitor Counter is a reliable circuit that takes over the task of controlling the room lights as well us counting number of persons /visitors in the room very accurately. When somebody enters into the room then the counter is incremented by one and the light in the room will be switched ON and when any one leaves the room then the counter is decremented by one. The light will be only switched OFF until all the persons in the room go out. The total number of persons inside the room is also displayed on the seven segment displays. The microcontroller does the above job. It receives the signals from the sensors, and this signal is operated under the control of software which is stored in ROM. Microcontroller Atmega continuously monitors the Infrared Receivers. When any object pass through the IR Receiver's then the IR Rays falling on the receivers are obstructed. This obstruction is sensed by the Microcontroller.

Hardware Requirements:
- Microcontroller ATMEGA328P:
  In-System Programmable Flash
- IR sensors
- Seven Segment LCD Display: 5V dc
- Relay Unit: +12V dc to 230V ac
- Power Supply: 230V,5Hz ac
- Bridge Rectifier: 20V,2Amp
- Electrolytic Capacitor: (1000μf,35V) and (10μf,63V)

- Ceramic capacitor: 220µf
- LED: 2V or 3V
- Registers
- Transistor
- Diodes

Software Requirements

2 Embedded C.
3 Proteus (Processor for text East to use): It is a Software used for simulation and designing PCB layout. It was created by Simone Zanella in 1998. It is fully functional and procedural. It consists of many functions and languages.
4 Flash Magic.
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II. METHODOLOGY
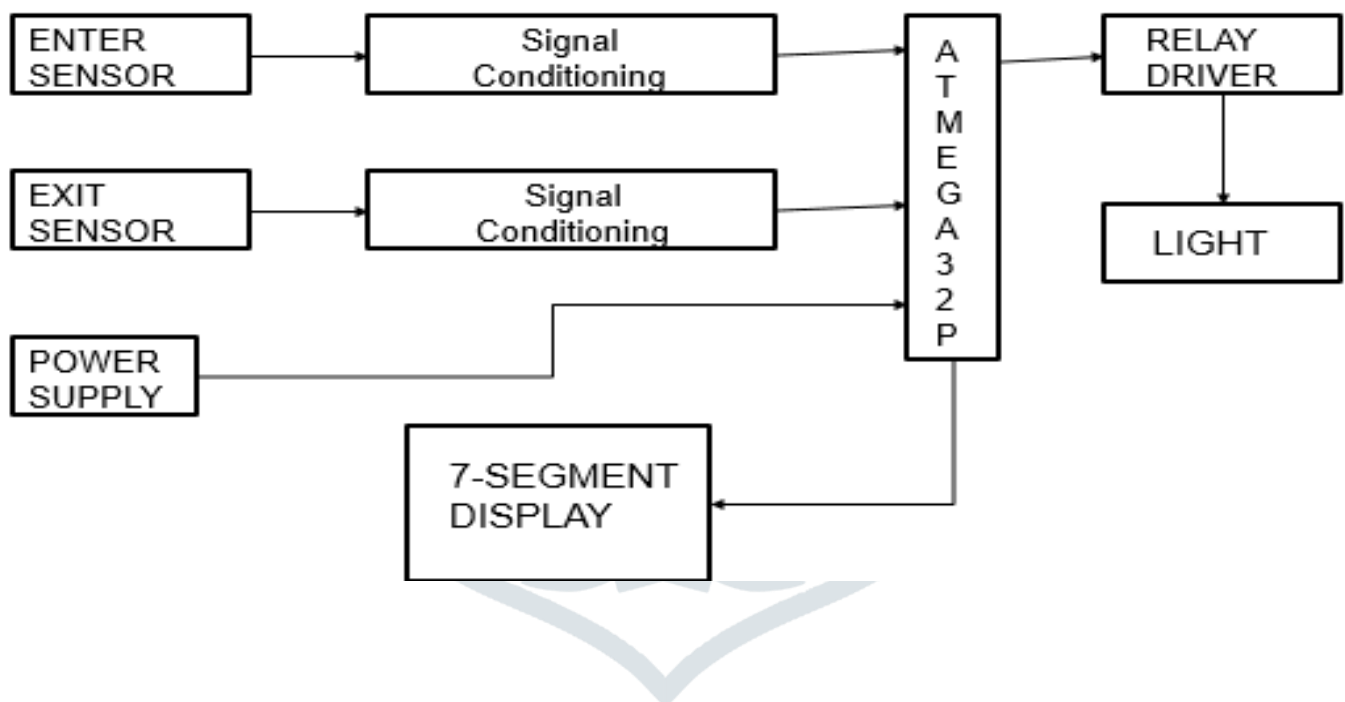
A. Block diagram

Fig . Block Diagram of Proposed System

The above block diagram illustrates a system where IR sensor, LCD display, Relay, power supply which connected to microcontroller.

IR Sensors

IR sensors are used to produce IR waves. In this Project there are two IR sensors. IR sensors consist of IR Transmitter and IR receiver. IR1 detects the numbers of individuals entering a room. IR2 detects the number of individuals leaving a room. The frequency range of IR sensors varies depending upon its cost. By using LED light at specified wavelength as required by the sensor, we can look at the intensity of the received light. When any object cuts the light emitted by LED, the light bounces back from the object to the light sensor. This results in a large change in the intensity, which is detected by receiver of IR sensor.

Fig.1 IR Sensor

LCD 16x2

LCD (Liquid Crystal Display) is used to display number of individuals in a room. It is very thin technology based on combination of liquid and crystal. Liquid state produces an image for display.

Fig.2 LCD display

Relay

In relay driver circuit there are transistors, diodes and the relays. Relay driver circuit is used to control the light. This block can drive the various controlled devices. We are using +12V dc relay. As µC cannot drive relay directly so output signal from microcontroller is passed to the base of the transistor, which activates the particular relay so that it can select particular device to operate. Relays can control the charge flowing to the load. Load may be and AC device such as light, fan, Bulb etc.
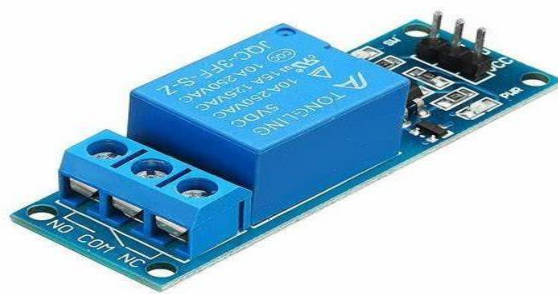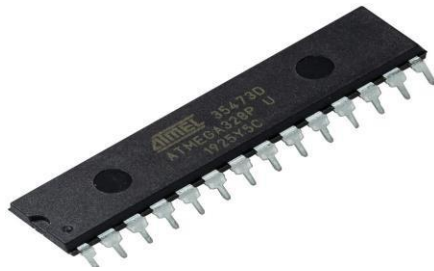

Fig.3 Relay

Microcontroller AT MEGA328P

ATMEGA328P is high performance, low power controller from Microchip. ATMEGA328P is an 8-bit microcontroller based on AVR RISC architecture. It is the most popular of all AVR controllers as it is used in ARDUINO boards. ATMEGA328 is used similar to any other controller. All there to do is programming. Controller simply executes the program provided by us at any instant. Without programming controller simply stays put without doing anything ATMEGA328 is used similar to any other controller. All there to do is programming. Controller simply executes the program provided by us at any instant. Without programming controller simply stays put without doing anything as said, first we need to program the controller and that is done by writing the appropriate program file in the ATMEGA328P FLASH memory.

Fig.4 ATMEGA328P

B. Working

This project automatic room light controller with bidirectional visitor counter is a reliable circuit that takes over the task of control

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Fig.5 Hardware Implementation of a System

III. RESULT AND CONCLUSION

This project deals with the usage of the energy in this competitive world of electricity. This project is efficient enough to let someone know about the accuracy of the person entered and have taken the exit from the room. This project saves more electric power than it seems and also collaborates the knowledge of electric and digital study. One can be knowledgeable about two different study at the same time with this project. It not only teaches us about the functioning of the but also teaches us how we can preserve electricity even in the electricity based project.

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