

# Museum Security System based on 8251 Microcontroller

K. Varun Kumar, K. Bharadwaj, K. Mounika

B. Tech, Swarna Bharathi College of Engineering, Khammam

**Abstract:** The advanced Museum security system has changed to the modern security system and some of them can be implemented in our day to day life. Security systems are protected in the museum from the thief, dangerous incidents in antiques and surroundings. The Museum security system starts from keeping the things safety. The best way to protect the Museum is by installing the Museum security system. There are two different types of the security system, i.e. wired and wireless security system. Nowadays, most of them are using wireless security system. It is easy to use and protected by the unknown person. The wireless system securities are camera, motion sensor detector, alarm sound with the help of this the Museum is secured with each of their functions. The Museum security systems are frequently used by the monitor detector and motion sensor and these are placed in unknown places.

**Keywords:** IR (Infra Red), LCD, PC, CPU, EEPROM, GSM, PIR Sensor.

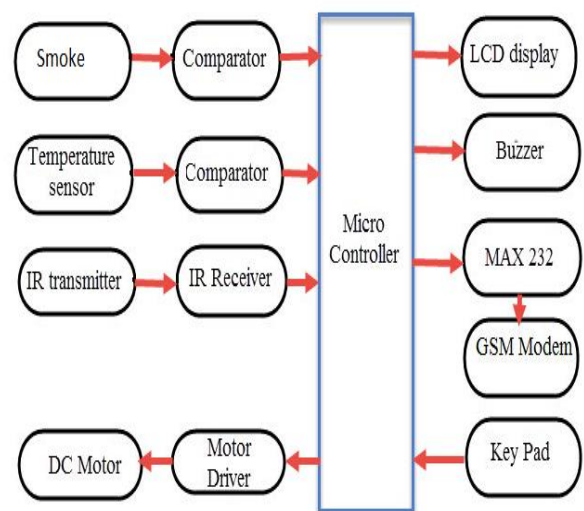
## I Introduction

Museum security system can be attained by adopting essential controllers to protect Museum antiques that can be detected by different variables using suitable sensors. This security system involves the security hardware like property, locks, doors, lighting, alarm systems and security cameras. The main advantage of the proposed system is a sensor system that gathers the information from parameters such as fire, temperature, gas, human presence, etc., and sends the related information to the Microcontroller. The Microcontroller used in this system is pre programmed such that when the parameters cross their prearranged limits, it sends the control signals to different controlling devices like motors, relays, and buzzer devices. The proposed system can be implemented by using the following functional blocks.

*Museum Security System with 8051 Microcontroller*

There are three basic modules in the Museum security systems which are given below. The first

module is IR transmitter and receiver[1] module it is used for the doors for the safety purpose in the nighttimes and when the person goes outside. If an unauthorized person is entered in the Museum, then the IR sensors are activated by the buzzer. Then the beep sound is produced by the buzzer. The second stage of the module is an **Smoke sensor**. It is used to detect the Smoke. If the smoke is detected by the sensor then the buzzer is activated and produces the sound. The third module is the door (either for main door or glasses on antiques) opened with the help of a password by using the keyboard. If the unauthorized person enters the three wrong passwords consequently. Then the data of all modules are sent to the computer through the serial ports. The following block diagram shows the **Museum security system by using the 8051 Microcontroller**.



Museum Security system

### *Infra Red Transmitter*

This transmitter is to apply in the theft detection module with the help of the one transmitter and one receiver. The infrared transmitters are used in the detection of theft because the unauthorized person cannot be visible to the human eyes. The IR LED'S transmitters are used.

### *Infrared Receiver*

The infrared receiver is an active low device, hence it gives the low output when the infrared rays receives.

### *Smoke sensor*

The Smoke sensor[2] is used to detect the smoke in and around the Museum.

### *Microcontroller*

The CPU is the main function and 8051 Microcontroller[3] is used in the Museum security system. The 8051 has various functions which are described below.

- Reading in the digital input from the Infrared receiver.
- Reading the Smoke sensor output to produce the buzzer sound.
- Sensing the password using keyword and check it is a correct password or not.
- Sending the data to LCD and to the computer serial port.

### *LCD*

We are using 16 \* 2 alphanumeric liquid crystal display. The LCD contains 16 characteristics with 2 lines. Hence it can display the numbers and alphabets.

### *PC Interfacing*

In the PC interfacing we are using the MAX 232 IC to interface number of persons entered in the room and also the stats of entered password is correct or word is sent to the PC.

### *Keypad*

By using the keypad the user can enter the password. There are different types of keypads are available such as

- 0 to 9 keypad
- Enter keypad
- Escape Keypad

### *EEPROM*

It is an external memory and used to store the passwords. For the communicative purpose of EEPROM[3] with 8051 Microcontroller I2C bus protocol is used.

### *GSM Modem*

In the Museum security system we have to use sim300 as a GSM modem[5]. It has to find the number of persons inside the hall, number of wrong passwords entered on the keypad and also leakage of LPG gas. The GSM can communicate with the calls, SMS, or with the help of the MMS.

In the **wireless Museum security system cameras** play an important role. The uses of cameras is easy and can be monitored from the phone or from the PC. The camera can capture the footage from within the signal and the footage can be stored on the computer hard drive.

Another aspect of the security system is by using the alarm system. When the alarm produces the sound, then the owner or the authorized person will recognize that other person has entered in the Museum. There are many reasons to produce the security alarm sound from freeze, if doors are opened, and when the fire exits and broken window.

### *Temperature Sensor*

Museum security system can be implemented by using temperature sensor[6]. The external obstacles have then temperature sensors and for sensing the atmospheric temperature one or two temperature sensors are used. From every obstacle sensor the atmospheric temperature readings are compared. If there is any high difference in the temperature variation will have a possibility that some external obstacles are present. The following are the interface and drives for the alarm.

- PIC 16F877 IC
- n + 1 or n+2 temperature sensor
- Alarm
- MPLAB IDE
- MPLAB development kit

The IC PIC 16F877 is used because it has the capability to read directly from an analog device. This IC can interface with the temperature because

the **temperature sensors are analog devices**. To compare the operations the embedded program is used and the device is used as an external alarm.

## II PIR Sensor Motion

The PIR motion sensor[6] is an electronic sensor which is abbreviated as a passive infrared sensor. The function of this sensor is to find the human body with a certain range of frequency. This sensor is used for the people, animals, and other objects. This type of sensor is mostly used in the theft alarm, and automatic light activated system. The following diagram shows the **basic PIR sensor motion image**.



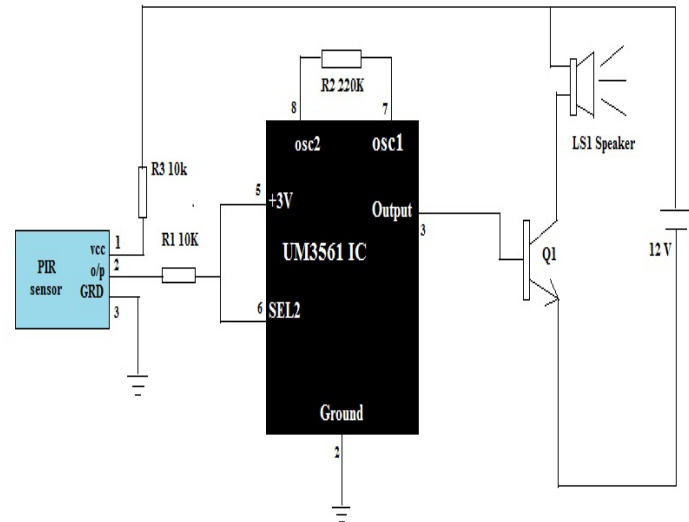
PIR Sensor Motion

### Alarm System Using a PIR Sensor

In this type of process, we will use the IC UM3561 which is an integrated circuit. The circuit takes the digital input and generates the sound in some of the devices like police siren, ambulance, fire engine. Hence, by using the PIR sensor circuit the human beings are detected and the digital output is generated. For the IC UM3561 if digital output is given, then the IC produces the sound.

### Circuit Diagram Using PIR sensor For Alarm System

The following circuit diagram shows the alarm system using PIR sensor. The intention of this circuit is to provide the security for Museums. The PIR sensor detects the infrared radiations from the human body and gives the digital output. The digital output is passed through the IC UM3561 hence it produce sound when the human body is detected.



Circuit Diagram Using PIR Sensor For Alarm System

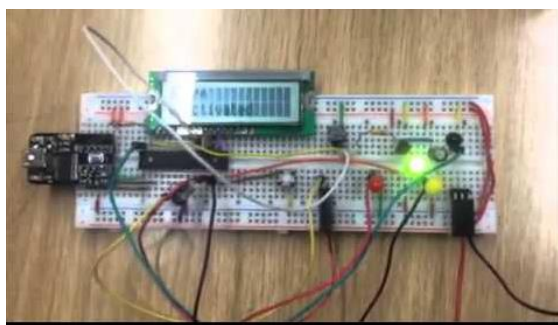
The circuit diagram consists of PIR sensor, UM3561 IC, speaker, and transistors. The IC used in the circuit is a siren generator IC and it has 8 pins. The 5th and 6th pins are short circuited and connected the output of the PIR sensor through the resistor. The IC of 7th and 8th PIN are connected to the 220k resistor. The 6th and 1st pin is used to select the sound and these pins and produce the sound.

The output is collected from the 3rd pin and it is connected to the speaker with the help of a transistor and resistor. The base of the transistor is connected to the IC output through the 470 ohm resistor and the battery is connected to this resistor and speaker. The emitter pin of the transistor is connected to the ground.

### Applications of PIR Sensor

- The PIR sensors can be used in the shopping malls, Garden lights, etc.
- These sensors are used for the outdoor lights.
- It used in the multi apartments for security reasons.
- Covered parking area.

### III Results and Discussion



- The top one is LCD modem.
- Top right one is GSM Module
- Down Right shows smoke sensor, Led, Temperature sensor.
- Down top right shows Buzzer
- Down middle shows PID controller

### IV Advantages of Museum Security System

- The security system is used for the security purpose in the Museums, dinning halls, rooms.
- It is also used in the apartments, function halls, petrol bunks.
- The security system is also used in the classrooms, examination halls etc.

### V Conclusion

This article gives the information about the Advanced Museum Security system. The sensors used in the proposed system are quite advantageous which are being implemented. Future scope of this system is to advanced micro controllers and system must be able to send the data to all the surrounding security authorities, can sense the difference between employees and their authorization, can be controlled wirelessly and can be monitored from anywhere any place.

### VI REFERENCES

- [1][http://education.rec.ri.cmu.edu/content/electronics/boe/ir\\_sensor/1.html](http://education.rec.ri.cmu.edu/content/electronics/boe/ir_sensor/1.html)
- [2] [https://en.wikipedia.org/wiki/Smoke\\_detector](https://en.wikipedia.org/wiki/Smoke_detector)
- [3]<http://www.microchip.com/wwwproducts/en/ATmega8>
- [4] <https://en.wikipedia.org/wiki/EEPROM>
- [5] <http://electronicsforu.com/resources/gsm-module>
- [6] [http://www.electronics-tutorials.ws/io/io\\_3.html](http://www.electronics-tutorials.ws/io/io_3.html)