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Home Security System with GSM Using 8051 Microcontroller

Ravi Gedam*, Nilesh Chikhle**, Ishaan Singh**, KomalTidke**
**(Computer Science & Engineering Department, G H Raisoni University, Saikheda)*
**(Computer Science & Engineering Department, G H Raisoni University, Saikheda)*
**(Computer Science & Engineering Department, G H Raisoni University, Saikheda)*
**(Computer Science & Engineering Department, G H Raisoni University, Saikheda)*

ABSTRACT:
These days, everything in our life is getting easy and simple. With less efforts if we can control the various aspects of our home using IOT, it would be worth for most of the people. We can do anything from anywhere with the help of remote-control system. All the parts of the remote-control system are password protected. Door and windows security system would be connected to alarms which would be placed in the house centrally. [1] Motion detection system could be used in the cameras during the time when no one is at home. [2] It would be a one-time investment with most of it in the sensors and microcontroller. Also, fire alarm system uses temperature sensor which can sense if there is any big raise in temperature and therefore it would ring the alarm. [1] LED is must. It would be required outside the doorsforshowinganydesiredoutput. [1]Itwouldbeasuccessinfutureifitgoeswell.Hereinthispaper, we present home automation system with GSM using 8051micro-controllers

KEYWORDS —MQ2 sensor, MQ6 sensor, Wi-Fi module etc.

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I. INTRODUCTION

Micro-controller 8051 is one of the most popular. In 1981, Intel introduced a micro-controller called the 8051. [2] It is used in a wide variety of embedded systems like robotics, automotive industry, remote control, power tool, telecommunication application, etc. There are 40 pins of 8051 micro-controller. There has been much research done on various types of Home Security systems like Sensor-based Home security Systems, Palm-print, Figure print, and keypad activation for authentication and so many. The maximum type of Security system uses only a technique of GSM module. [5] This system is fully digital and also can be totally changed based on need. The project works like entering a passwordwhich if correct would let you enter the door or bypass any other restricted access. There are many parts of this project it is based on. These are like alarm system, theft system, the safety of house, gas leak system, automatic window and door opening/closing. [4] We can add or subtract according to our needs, resources available, and various other aspects. Also, there would be switches used for analog or digital data. This all would be fully digital and would overall make the home a smarthome.

II. PROPOSED METHODOLOGY

In case a house got fire, the temperature will rise automatically. To detect this, a temperature sensor is being used whichwilldetect the temperature of the surroundings and send it to the micro-controller which will ring in case of a very high temperature. [3]An ATmega16 AVR micro-controller is used for the control. It has a digital converter, an external ADC, which is not required for converting the analog temperature into a digital value.[5] LM35 Temperature sensor is mostly used as a way of temperature sensing of our surroundings temperature.[4]]If temperature is maximum in contrast with the preset temperature declared by the person who is using it, if it's more than the standard stated, then the buzzer gets activated otherwise it doesn't.[4]pins 6 of them can be as the analog inputs, 6 PWM outputs, a 16 MHz quartz crystal, an ICSP header, a power jack, a USB connection, and a reset button are the basic functions of the micro-controller. The code's written over the Arduino Uno board with the help of a simple USB cable. With the help of MQ2 sensors and MQ6(gas sensor) which detect gas and provide the input to Arduino, then the micro-controller computes the input and provides the output on to the LCD display, Buzzer, LED. [5] Arduino Uno board can be reused by resetting (using the reset button) the code written onit.

BLOCK DIAGRAM

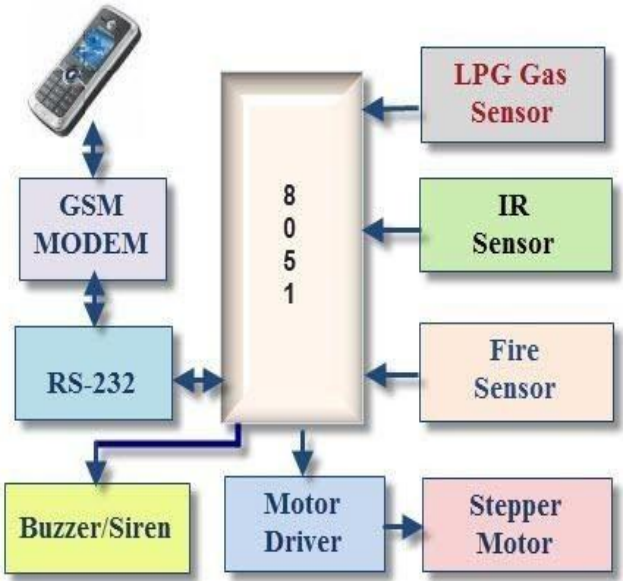

Figure 3.1: "Block diagram of Home Security System with GSM Using 8051 Microcontroller"

III. TOOLS &COMPONENTS

The tools and components used to build the Home Security System with GSM using 8051 micro-controllers are as follows:

A. ArduinoUno Kit:

Arduino Uno is an ATmega328P based micro-controller. It has 14 digital input/outputpins 6 of them can be as the analog inputs, 6 PWM outputs, a 16 MHz quartz crystal, an ICSP header, a power jack, a USB connection, and a reset button are the basic functions of the micro-controller. The code's written over the Arduino Uno board with the help of a simple USB cable. With the help of MQ2 sensors and MQ6(gas sensor) which detect gas and provide the input to Arduino, then the micro-controller computes the input and provides the output on to the LCD display, Buzzer, LED. [5] Arduino Uno board can be reused by resetting (using the reset button) the code written on it.

Figure 4.1: Arduino Uno

B. MQ6 LPG gassensor:

Figure 4.2: MQ6 LPG gas sensor

MQ6 has Good sensitivity to Combustible gas in a wide range. The gas sensor MQ6 has the accomplished of detecting hazardous gases such as LPG, iso-butane, propane, LNG. MQ6 Liquefied petroleum

gas sensor is easy to use to detect the gases. MQ6 sensor detects LPG and other gases spillage and response in less than 10 seconds and gives input to the Arduino board. [5] MQ6 LPG sensor is cost-efficient. The range of the MQ6 sensor is 100-10,000 ppm concentration of LPG, iso-butane, propane.

*C. MQ2 Flammable Gas and Smoke Sensor*Module:

D. ESP8266 WIFImodule:

ESP8266 WIFI module has the capacity of providing storage to sensed data. This module gives access to the Arduino Uno to the Wi-Fi network. It has SOC with an integrated TCP/IP protocol stack. It also provides notifications on the mobile phone applications.

Figure 4.4: ESP8266 WIFI module

E. Buzzer:

Buzzer is use to create a hairy sounding alarm to alert and prevent the peril of catastrophic accidents. A buzzer usually has piezo disc with an oscillator. When the buzzer get the signal, the oscillator propagate a frequency which is around 2-4 kHz and thisleads piezo element to vibrate correspondingly to produce the sound.[5]

Figure 4.5: Buzzer

F. Relay

A relay is a switch which controls (open and close) circuits electromechanically. [3]

Figure 4.6: Relay

G. LED:

Light Emitting Diode (LED) is one of the useful semiconductor devices which glows when the current passes inside it. In GPG gas leakage detection and indication system the LED glows when the spillage is detected and there is a peril of explosion.[5]

Figure 4.7: LED

H. LCD:

A LCD is a liquid crystal display, which is connected with a Arduino board and this is used in proposed system to display the massage on the screen that "GAS LEAKAGE DETECTED" spontaneously. [5]

Figure 4.8: LCD display

IV. LITERATURESURVEY

Any research done was on Machine-to-machine Communication which is based on Smart and elegant Home and SecuritySystem, Fingerprint, and with Mobile Android Application. A GSM module placed with a recommended message is sent to the logged key to an M2M communication. This system with a smart android mobile app (i.e., applications) leads to battery drainage and requires enough precious storage in the user's mobile phone. [3] Also, there is a need for internet connectivity for this system. One of the researches done was on an IOT based Security Alert System for Smart Home so that it could detect a thief or any other strange occasion that happens at the house when the house is empty.

V. CONCLUSION

System of Fire Alarm - This system works by alarm ringing when the particular temperature escalates above a pre-threshold capacity. Then this makes the owner receive a notification through Message about the same. System of Motion Detector - This can be used at doors and windows for protection when you are outside of your home. [1] It operates on the concept of the mass of the light falling on photodiodes. If light falls frequently on the photodiode, its figure is 255 in decimal. But if it is obstructed by a barrier/ thief, the voltage would fall which would be < 51 in decimal. This rings the siren and lets the landlord know about theft orburglary.

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