

# Wireless Home Security System

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**Abstract-** Home security is necessary for protection from burglary at home. Wireless home security system attempts to notify or signal the owner if something suspicious is noticed. It attempts in securing the entry points in the home. Sensors are used to which are connected to the arduino which will make a move depending upon the situations whether to send an sms, or turning an alarm or turning on the lights. If someone enters from door or tries to break the windows the owner will come to know about it

## I. INTRODUCTION

Home security is security at home, places to ensure safety from burglary. Safety and security of home is a primary concern for all. Latest technologies provide user the ability to handle the electronic appliances. According to FBI, 58% burglaries in USA involves forcible entry. According to reports, a burglary lasts for 8 to 12 minutes and a burglar is able to break in within 60 seconds. But this project is not just limited to protection of house but provides overall security. In this project we will attempt in providing an overall security at a place. In this project we will try to make a model which is able to detect if someone tries to break the doors, try to break in through walls or any gas leakage happens the system be able to make decisions by itself. IOT is helpful in making such systems and thus we are use it. We are using Arduino(like Atmega328 microcontroller) which is smart enough to make smart decisions. Arduino will be centralized. We are using a microcontroller because firstly it provides digital output, secondly it is cheap and easily available and third it is able to make smart decision at its own. It will receive the information from sensors and will make the decision accordingly. We are using PIR sensor, motion sensors, reed switches, MQ5.



Fig: Components of home security systems

## II. HARDWARE REQUIREMENTS

- Arduino(like Atmega328)
- PIR Motion Sensor
- MQ-5 LPG sensor.
- Reed switch.
- GSM Modem
- Piezo Buzzer
- NPN Transistor BC548
- Resistor 1K ohm

## SENSORS REQUIRED

- Passive infrared sensor motion sensors (to detect movement of a burglar)
- MQ sensor (to detect LPG leakage)

## III. OBJECTIVE

For security, the system will work on wireless communications and latest mobiles. The system we chose offers a remote controlling of appliances, intrusion detection, system security. Such system automatically adjusts the system settings on running hardware support check. The objectives of the system are as follow:

To develop home security system that

1. Is able to take rapid actions and prevents crime from happening.
2. Provides a system which is able to detect gas leakages.
3. Safety of children's are going to be protected by authorization and authentication of a system.
4. Efficient communication will happen by using wireless communication technology.
5. Users can store and consider data on internet.

#### IV. SYSTEM DESIGN

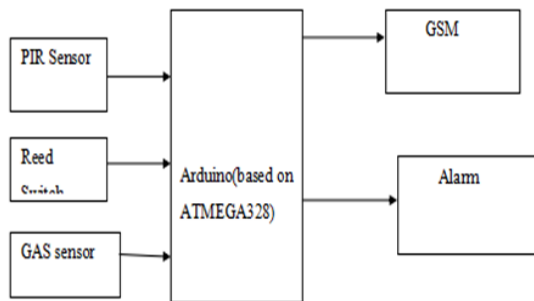


Fig: System Design

Microcontroller Board-It consists of a micro-controller (atmega328) and a timeout generator circuit. This is the main module of the system. Whenever any movement is detected, the PIR motion sensor sends a digital output to atmega 328. The GSM Module communicates with the atmega 328 in a serial manner. It consists of Rx and Tx pins. These pins are connected to Tx and Rx pins of the microcontroller (atmega 328) . Once the SMS message arrives, text words are checked with predetermined format which incorporates desired device ON/OFF commands. To read a message the microcontroller sends the acceptable AT command to the Receiver GSM Modem through UART. The Modem then responds with the message and therefore the microcontroller stores the message within the RAM. When the message ends there's no thanks to know by the microcontroller. The time-out generator circuit performs the main function. It provides the microcontroller board with the power to detect the top of a message from the receiver GSM mobile. The output of the time-out generator circuit (connected to port1\_3 of the microcontroller) is low until the message is being received and becomes high at the top of the message. The microcontroller then

processes the command and sends the acceptable controlling signal to the switching module.

ATmega-328 is essentially a complicated Virtual RISC (AVR) micro-controller. It supports the info up to eight (8) bits. ATmega-328 has 32KB internal builtin memory. This micro-controller has a lot of other characteristics. We can also have a look at Introduction to PIC16F877a (it's a PIC Microcontroller) and then compare functions of these two Microcontrollers.

ATmega 328 consists of EEPROM (Electrically Erasable Programmable Read Only Memory). It has 1KB of EEPROM these are generally used to store the codes or programs. This property shows if the electric supply supplied to the micro-controller is removed, even then it can store the data and can provide results after providing it with the electric supply. Moreover, ATmega-328 has SRAM( Static Random Access Memory). It contains 2KB of SRAM. SRAM retains the data till the electricity is provided. ATmega 328 has several different features which make it the foremost popular device in today's market. These features contains advanced RISC architecture, good performance, low power consumption, real timer counter having separate oscillator, 6 PWM pins, programmable Serial USART, programming lock for software security, throughput up to 20 MIPS etc. ATmega-328 is mostly used in Arduino.

#### V. COMPONENTS AND THEIR FEATURES

##### 1) PIR Sensor

1. Wide range on input voltage varying from 4.V to 12V (+5V recommended)
2. Output voltage is High/Low (3.3V TTL)
3. Can distinguish between object movement and human movement
4. Has to operating modes - Repeatable(H) and Non- Repeatable(H)
5. Cover distance of about 120° and 7 meters
6. Low power consumption of 65mA.

##### 2) REED Switch:

The simplest magnetic-field sensor is a reed switch. It contains two ferromagnetic nickel and iron reed elements in an evacuated, hermetically sealed glass tube to attenuate contact arcing.

When an axially aligned magnet approaches the switch, its magnetism closes the reeds. The magnet typically generates a minimum of a 50 Gauss force to beat the return force or spring of the reed elements.

**Reed Switch**

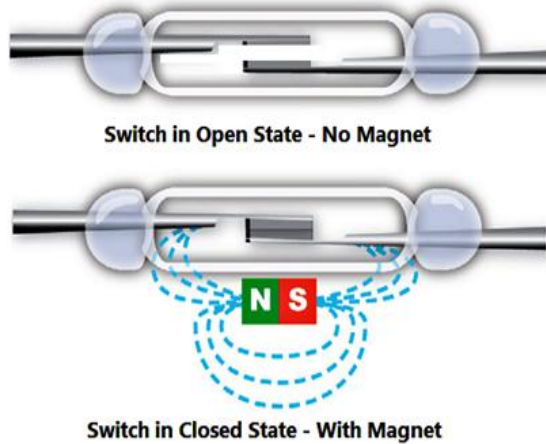


Fig: Reed Switch

**3) ARDUINO BOARD**

The Arduino Uno may be a microcontroller board that supports the ATmega328 (datasheet). It's fourteen digital input/output pins (of that six are usually used as PWM outputs), six analog inputs, a sixteen megacycle per second ceramic resonator, a USB association, an audio jack, an ICSP header, and a push button. It consists of everything that is needed to be supported by the microcontroller; merely connect it to a laptop with a USB cable or power it with a AC-to-DC adapter or battery to start out. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it options the ATmega16U2 (ATmega8U2 up to version R2) programmed as a USB-to-serial converter. Revision 2 of the Uno board options a electrical device actuation the ATmega8U2 HWB line to ground, creating it easier to position into DFU mode.

Microcontroller ATmega328 operational Voltage 5V  
Input Voltage (recommended) 7-12V

Input Voltage (limits) 0-20V Digital I/O Pins fourteen (of that six give PWM output) Analog Input Pins 6 DC Current per I/O Pin 40 mA DC Current for 3.3V Pin 50 mA memory board 32 kilobyte (ATmega328) of that 0.5 kilobyte utilized by bootloader SRAM a pair of kilobyte (ATmega328) EEPROM one kilobyte (ATmega328)

Clock Speed sixteen megacycle per second  
Schematic & Reference style

EAGLE files: arduino-uno-Rev3-reference-design.zip (works well with Eagle v1.0 and newer) Schematic: arduino-uno-Rev3. The Arduino style will use associate ATmega8, 168, or 328. On current project we tend to use area unit victimisation associate ATmega328. On all 3 processors, the pin configuration is identical.

The Arduino Uno area unit usually steam-powered via the USB association or with associate external power offer. The ability supply is chosen mechanically. Providing external (non USB) power from associate AC-to-DC adapter or battery. The adapter area unit usually connected by plugging a pair of 1mm center-positive plug into the board's power jack. Leads from battery area unit usually inserted inside the Gnd and Vin pin headers of the power connection. The board will operate with associate external offer of 0 to 20 volts. If supplied with however 7V, however, the 5V pin may give however 5 volts and so the board may even be unstable. If victimisation quite 12V, the electrical device might overheat and harm the board. The counseled vary is seven to twelve volts.



Fig: Arduino board (front and back)

1) MQ SENSOR

MQ-5 gas sensor is highly sensitive to LPG, Propane and Hydrogen and easily recognises in air. It also can be used to detect Methane and other combustible gases in air. It will easily detect gas leakage and the owner get alert about it before any mishappening take place. Sensor is very cheap and easily can be available in market. It can also be used to measure the quality of air. The gas sensor is made of steel and under it a sensing element is placed.

This sensing element is subjected to current through leads. This current is known as heating current. When gases leak in the vicinity of the sensor, gases get ionized and are absorbed by the sensing element. This changes the resistance of the sensing element which varies the value of the current going out of it. It is very cost effective. In market, it is easily available.

The following figure shows the Smoke Sensor.



Fig. 5: Smoke sensor module

V. TOOLS REQUIRED

S.no	Tools Name	Quantity	Price
1	Hot Melt Glue Gun	1	₹ 300
2	Glue Sticks	5	₹ 80
3	PCB Drill Machine	1	₹ 90
4	0.8 mm Drill bit	2	₹ 40
5	Soldering Iron	1	₹ 180
6	Micro Pointed tip for Solder Iron	1	₹ 30
7	Soldering bit cleaning Sponge	1	₹ 30
8	Soldering Wire	As Required	₹ 50
9	Soldering Flux	As Required	₹ 10
10	Etching Power	100 gram	₹ 80

IV. CONCLUSION

In this project, we tried to make a home automation system which provides security at home, place or any property where we install it. In future we can add many more elements to it. It has a lot of scope for advancement. Many more sensors can be used to make it even better. We have made an attempt to make such project based on IOT. Due to the performance, cost efficient, simplicity and reliability home automation system are making its position in global market. Technology has become so advanced that soon we can see every home a smart home.

REFERENCES

[1] Kim author, brandy Ghobril, Sami Malek, RouwaidaKanj, AymanKayssi “Low value Arduino/Android-based Energy-Efficient Home Automation System with good Task Scheduling”, 2013 Fifth International Conference on machine Intelligence, Communication Systems and Networks.

[2] HayetLamine and HafedhAbid,” device of a domestic instrumentality from AN robot application supported Raspberry pi card”, IEEE group action fifteenth international conference on Sciences and Techniques of Automatic management & pc engineering - STA'2014, Hammamet, Tunisia, December 21-23, 2014.

[3] YunCui, MyoungjinKim, YiGu, Jong-jinJung, and HankuLee, “Home Appliance Management System for observation Digitized Devices victimization Cloud Computing Technology in present detector Network Environment”,Hindawi business enterprise Corporation International Journal of Distributed detector Networks Volume 2014, Article ID 174097

[4] Shih-Pang Tseng, Bo-Rong Li, Jun-Long Pan, and ChiaJuLin,”An Application of net of Things with Motion Sensing on good House“, 978-1-4799-6284-6/14©2014 IEEE.

[5] Kim author, brandy Ghobril, Sami Malek, RouwaidaKanj, AymanKayssi,” SmartPower Management System For Home Appliances And welfare supported Wireless Sensors Network And Mobile Technology”, ,2015 XVIII AISEM Annual Conference, 978-1-4799-8591-3/15©2015 IEEE