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Home Security System Based On GSM and Voice Module

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Abstract – *Home security is becoming necessary now a days as the possibilities of intrusion, gas leakage and fire accidents are increasing day by day. This leads to property loss and damage. The main aim of this work is to present an embedded system that prevents or lessen the chances of intrusion, gas leakage and fire accidents. This embedded home security is designed by the use of PIR sensor, LDR flame detector, and MQ-6 gas sensor. All these are sensors are built around the ATMEGA328P microcontroller. When the system detects is there any intruder is present or any gas leakage occurs or any fire accident takes place, then it alerts the owner through a call using GSM technology and Voice Module.*

***Key Words*: PIR sensor, LDR flame detector, MQ-6 gas sensor, ATMEGA328P, GSM, Voice Module**

1. INTRODUCTION

Security is the main concern for everyone. Everyone wants to live securely in his/her house. Everybody wants themselves to keep safe or secure from various incidents like theft in their house or accidents caused due to LPG gas leakage or accidents due to fire in their house. Now days many times we hear news about house robbery or theft in some houses, bungalows, flats. These robberies or thefts take place when nobody is in house or in some cases we find that robbery take place even if people are in their houses.

1.1 literature survey

Nikhil Agarwal, G.Subramanya Nayak uses password protected door system methodology in home automation system. The door lock is password protected with an LED based resistive screen input panel which operates by detecting difference in light intensity captured by the photo diode which is emitted by surrounding red LEDs and reflected by the finger. The display is a 16X2 LCD panel. IR Laser sensors are used to detect any obstacle while monitoring the windows and doors at night or when away. Fire alarm system uses temperature sensor LM35 which senses sudden considerable increase in temperature and raises alarm. They uses the following components in those automation system i.e. IR sensors, LCD Display, Temperature Sensor, Microcontroller, Relay, Power Supply, GSM Modem.

1.2 AREA OF THE PROJECT

Embedded systems are designed to do some specific task, rather than be a general purpose computer for multiple tasks. Wireless communication has become an important feature for commercial products and a popular research topic within the last ten years. There are now more mobile phone subscriptions than wired-line subscriptions

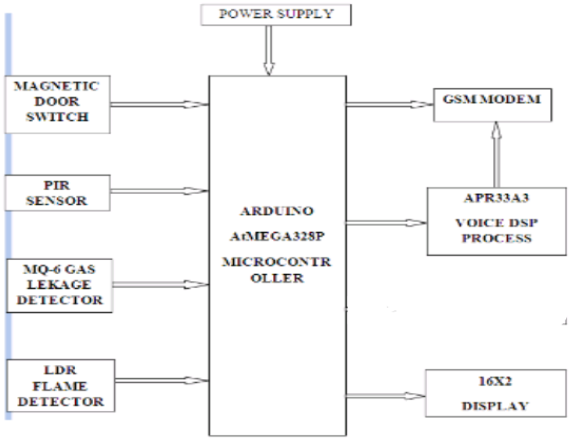
2. OBJECTIVE

An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are Microprocessors and Microcontrollers.

Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result. Home security system using AT328P Microcontroller is a project which is used to prevent the house from robbery, gas leakage and fir accidents.

2.1 PROPOSED SYSTEM

When anyone of the sensor gets activated it sends signal to microcontroller. Microcontroller activates the voice and GSM modules. And then the user gets a voice call with pre-recorded voice message using the GSM technology.



2.1.1ARDUINO UNO WITH ATMEGA 328P

The Atmel ATmega328P is one member of the Atmel 8-bit microcontroller family. Each member of the family has different amounts of RAM, ROM, I/O ports, etc. Depending on the number of external pins required they may come in packages with more than a hundred pins, or with as few as eight.

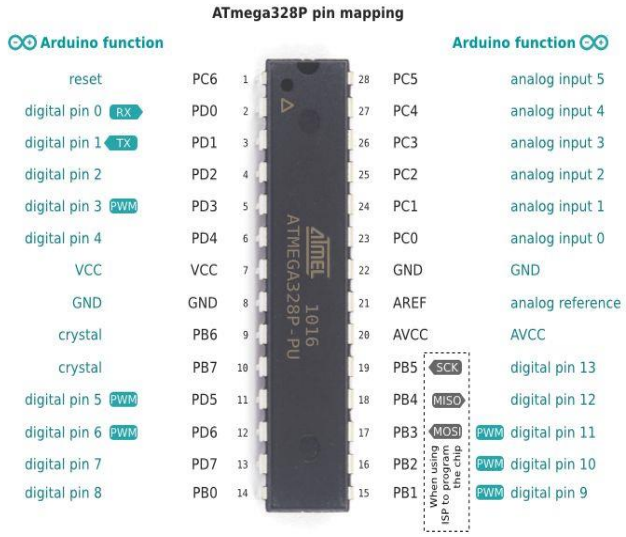


Fig1:-ATMEGA328P

2.1.2 PYRO ELECTRIC INFRAEED SENSOR

PIR is basically pyroelectric infrared sensor. The term passive means this PIR device only accepts incoming infrared radiation, it doesn't emit " infra" means below our ability to detect it visually, and "red" because this Colour represents the lowest energy level, As human eyes have property to sense before it becomes invisible. Thus infrared means below the energy level of red Colour, which is applied to many sources of invisible energy.

Fig2:-PIR SENSOR

2.1.3 MAGNETIC SENSOR

It is basically manufactured with magnetic materials two contacts are normally opened when there is no external magnetic field. If there is a small magnet near by the magnetic sensor make the contacts to be short circuited this connected to the opto-isolator. The output of Opto-isolator connected to the input port of microcontroller.

Fig3:-MAGNETIC SENSOR

2.1.4 GAS SENSOR MQ6

This is a simple-to-use liquefied petroleum gas (LPG) sensor, suitable for sensing LPG (composed of mostly propane and butane) concentrations in the air. The MQ-6 can detect gas concentrations anywhere from 200 to 10000ppm.

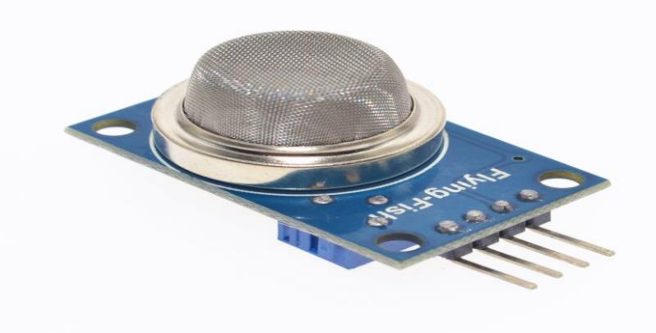


Fig 4:-GAS SENSOR MQ6

2.1.5 LDR SENSOR

Light dependent resistors (LDR), are light sensitive devices most often used to indicate the presence or absence of light, or to measure the light intensity. In the dark, their resistance is very high, sometimes up to 1MΩ, but when the LDR sensor is exposed to light, the resistance drops dramatically, even down to a few ohms, depending on the light intensity. LDRs have a sensitivity that varies with the wavelength of the light applied and are nonlinear devices.

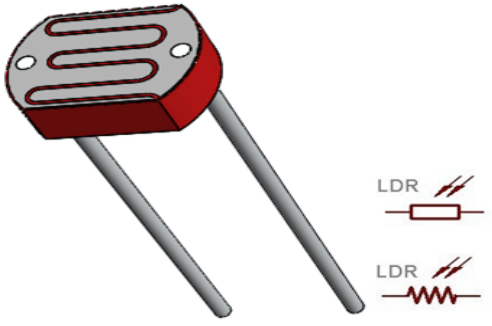


Fig4:-LDR SENSOR

2.1.6 LCD DISPLAY

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays, as in a digital clock.

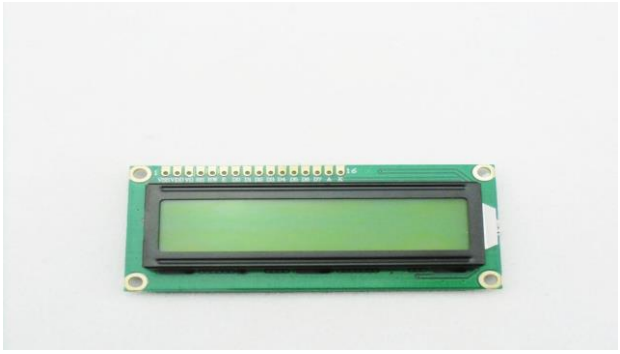


Fig5:-LCD DISPLAY

2.1.7 GSM MODULE

The GSM system is the most widely used cellular technology in use in the world today. It has been a particularly successful cellular phone technology for a variety of reasons including the ability to roam worldwide with the certainty of being able to be able to operate on GSM networks in exactly the same way - provided billing agreements are in place.

Fig6:-GSM MODULE

2.1.8 VOICE MODULE

The APR33A series are powerful audio processor along with high performance audio analog-to-digital converters (ADCs) and digital-to-analog converters (DACs). The aPR33A series are a fully integrated solution offering high performance and unparalleled integration with analog input, digital processing and analog output functionality. The aPR33A series incorporates all the functionality required to perform demanding audio/voice applications. High quality audio/voice systems with lower bill-of-material costs can be implemented with the aPR33A series because of its integrated analog data converters and full suite of quality-enhancing features such as sample-rate convertor.

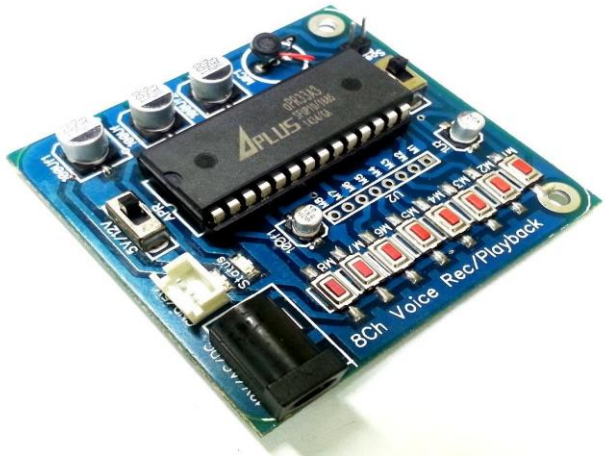


Fig7:-VOICE MODULE APR33PA3

2. RESULTS

When the system detects any object or intruder or gas or flame, System sends a signal to buzzer .Once any one of the sensor was activated the microcontroller sends an active signal to the gsm module and dsp voice processor which sends a voice call to the owner.

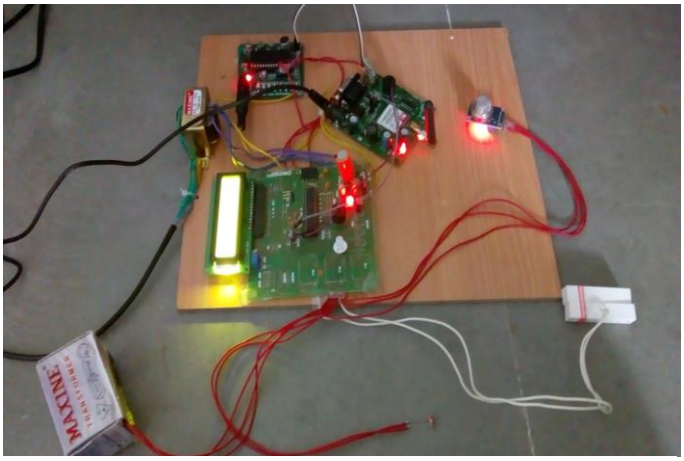


Fig8:-project kit in working state

3. CONCLUSIONS

The GSM based home security has been designed and tested with the mobile network. The user can get alerts from anywhere through gsm technology thus making the system location independent. A flexible way to control and explore the services of the mobile, AT commands is used in the system. The communication of home is only through the calls

which has been tested with the mobile networks and is working on any mobile network.

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