



PIR Sensor Based Burglar Alarm With SMS Alert Using GSM Module

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Abstract: This paper is about a PIR sensor based burglar alarm with SMS alert. The circuit senses the intrusion using a PIR sensor and sends an SMS to the given mobile number when an intrusion occurs. The number of intrusions taken place is also displayed on an LCD display. An 8051 microcontroller is used for monitoring the PIR sensor and sending the alert message using the GSM module. An alarm is also raised when the intrusion occurs. Here we use PIR sensor to detect and measure the IR radiations emitting from the source. GSM is a device that accepts a SIM card and operate in a GSM network. This can be used for the security purpose and can be related to many real time example.

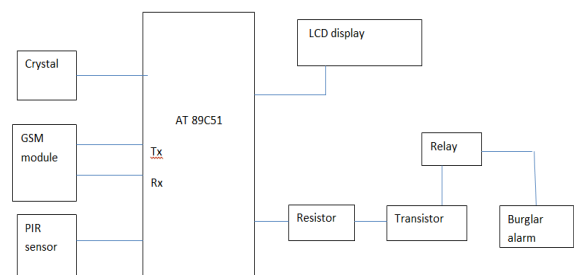
One of them is if a suspicious intruder tries to break in to the house this system alert the number of the house by sending a message to the member's mobile

In future we can even develop this system by not only sending the alert message but also the alert message along with the image of the intruder.

Introduction: the PIR sensor based burglar alarm with SMS alert using GSM module is mainly used for security purpose.

Security has become the most demanding thing nowadays, to protect a house or other valuables. Even our hand set smart phones has security that can protect the data inside. At such times security should be installed to get absolute peace of mind when you are out of station you must ensure that your home or the particular place is installed with perfect security monitoring system. This security system can be used to provide security system for residential, industrial and for all domestic and commercial purposes using GSM technique. Security systems are basically nothing but certain form of electronic devices that can be used to identify threats or attacks.

Block diagram:



Components:

PIR sensor

GSM module

Crystal

Resistor

Transistor

Relay

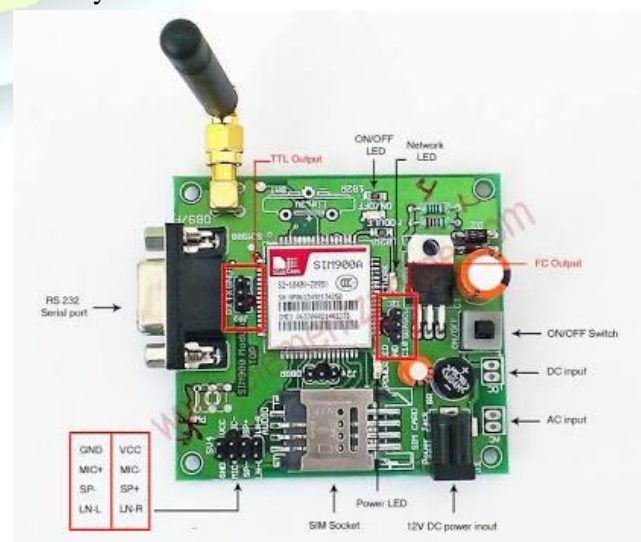
Burglar alarm

LCD display

PIR sensor: PIR sensor means passive infrared sensor. It is used to detect and measure the IR (infra red) radiations emitting from a source. The heart of the PIR sensor is a sensor core made of pyroelectric materials like Gallium Nitride. They simply produce an electrical output according to the intensity of IR radiations falling on it. In most cases an array of such sensors cores are used to improve detection. Numerous Fresnel Lenses arranged in the form of a dome is placed on the sensor face to focus as much as IR radiations on to the sensor face. Whenever a movement occurs in front of the PIR sensor, the intensity of the IR radiations falling on the PIR sensor changes and so do the sensor's electrical output.



GSM module: GSM (Global Systems for Mobile communication) Module is a device that can accept a SIM card and operate in a GSM network. A GSM module can perform various tasks in the network such as sending messages, accepting messages, dialing a phone number, receiving calls, sending and receiving voice messages, sending digital media etc. In simple words a GSM module can perform any task that is supported by the module itself and the network service provider. The network actually sees the GSM module just like a mobile phone. The common applications of GSM module are appliance switching devices, messaging systems, voice mailing systems, FAX systems etc.



Crystal , resistor, transistor, relay: The crystal is used to set the baud rates to the microcontroller. The function of resistor is to resist the high input current, so that the device which is connected to its output does not gets damaged. Transistor – when it is given with high input then the output will also be high. Relay is an electrically operated switch. The switch will be open for low inputs and closed for high inputs.

Burglar alarm: There different types of alarm used and this is a type of alarm. Usually these types of alarms are used for warning or as an alert signal.

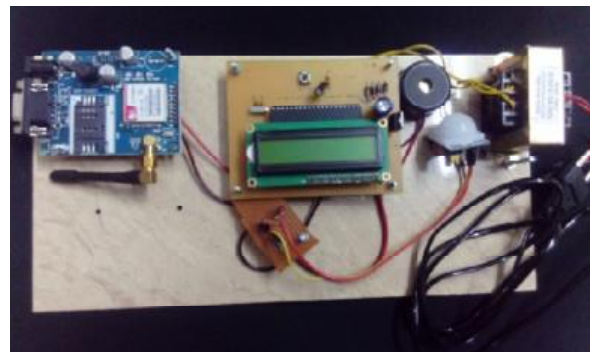
LCD display: This is used display characters, here it is used to store and display the number of intrusions occurred.

Working: The GSM module communicates with the 8051 using serial communication. Tx pin of the GSM module is connected to Rx pin of the microcontroller (pin10) and Rx pin of the GSM module is connected to Tx pin of the microcontroller. Output pin of the PIR sensor is connected to P3.5 of the microcontroller. Data pins (D0 to D7) of the LCD module are connected to Port 0 of the microcontroller. Each pins of Port 0 are pulled up using a 10K x 8 resistor network. Port 0 of the 8051 is open drain and has no internal pull up resistor. So we need external pull -up resistors to make it work properly as output pins. Control pins (RS,RW and E) of the LCD module are connected to P2.7, P2.6 and P2.5 of the microcontroller respectively. The LCD module we are using here is JHD162A. Resistor R4 is used for setting the contrast

of the display. Resistor R5 limits the current through the back light LED of the display.

Push button switch S2, capacitor C11 and resistor R6 are associated with the reset circuit. Capacitor C11 is used to de bounce the push button switch. The C11 actually by-passes the vibrations produced when the push button switch is pressed. If C11 is not used, the microcontroller will read all the vibrations as key presses and the system will perform multiples resets. Crystal X1 and capacitors C8, C10 are associated with the clock circuitry. The baud rate used for serial communication in this project is 9600. So the crystal needs to be exactly 11.0592 MHz for getting this baud rate.

Port 2.0 of the microcontroller is used for controlling the alarm. P2.0 is connected to transistor Q1 through resistor R7. R7 limits the base current of Q1. Resistor R0 (10K) is used for pulling up P2.0 pin. The relay is connected across the collector of Q1. D5 is a freewheeling diode. It by-passes the back emf produced when the relay is switched. If free-wheeling is not done, the back emf may destroy the transistor or even the microcontroller. The 12V buzzer is connected through thenormally-open contact of the relay.





CONCLUSION

This paper is entirely about providing security for our possessed things. In future we can enhance this system by sending the image of intruder along with the alert message.

