Smart Home Safety Arrangement

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Abstract – **Security is of prime importance in day-to-day life. Population is increasing at an alarming rate, which instigates robber, theft and other criminal activities. Therefore, security is required everywhere, in industries, banks, offices homes and all other worthy places. Many activities have already been started in this field to improve even the best possible security with affordable cost. Internet has already grown to such an extent that it is available in almost every corner of the world. It can be used and is getting used to provide the best possible security even to toughest of the places from remote places. This paper describes an internet based security system viz. Hi-Tech Security System, to satisfy the security demands for affordable multipurpose security aspects.**

Keywords- **Security System, EPABX, Remote Control, Sensor Systems, Webcam Surveillance.**

I.   INTRODUCTION

Today, the rate of crime is increasing at an alarming rate. A common man is tired and fed up with all such problems like robbery, theft, burglary etc. In recent years, security aspect has become more and more important in domestic, commercial and industrial application areas and many applications have already been started in this field. Home automation, smart home etc. are keywords in this new domain. The security is required in every aspect of life viz. banks, offices, industries and home to name a few. Demands for multipurpose security system for home usage, banks and industries have been on the rise.

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Internet will be one of the primary influences in the next generation. This paper discusses on Internet based security system which will provide multi facet security such as security against theft, intrusion, fire and providing assistance in emergency conditions. In this system, number of different sensors like intruder detector (IR sensor), touch sensor, smoke detector and emergency switches are placed in different locations at the place where security needs to be provided.

If any of the sensors get activated, then the system automatically triggers certain actuating elements as well as dials up police station, fire station, the concerned person and/or any other helping hand as situation may demand. Automatic turning up of CC cameras will play important role in post incident investigation and scrutiny if any such situation arises. It is also capable of sending messages and redialing the required station if it finds the system busy or kind of.

II.   OVERVIEW OF SAFETY ARRANGEMENT

Security systems are evolving rapidly all over the world as new technologies are getting developed in electronics, communication and sensor network systems. Hence, security vision has built up significant capabilities.

In general, security system comprises the following:

   a)   Control panel
   b)   Detection devices
   c)   Notification and alert devices
   d)   Protective and preventive devices.

The control panel is the brain of the security system. Various types of sensors can be used as detection

1

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devices and electric bells, alarms, hooters, telephone dialers etc can be used as notification devices.

The basic security system is capable of producing alarm signals, both inside and outside the perimeter under coverage. A higher and superior degree of protection can be achieved with an alarm system that can also notify central stations like police station, fire station etc, so that immediate preventive and pr5otective actions can be taken to handle the situation. Such a system is particularly useful when the user is away from the perimeter under coverage. For the aforesaid procedure to be undertaken, security system indulges internetwork connectivity as well as automated telephone dialer system with pre fed numbers of corresponding and concerned stations.

III.   WORKING OF SAFETY ARRANGEMENT

The complete system consists of a host and a client. The host consists of the following interfaces.

  i)   An interface card (to the parallel port of a host PC)
  ii)   A camera (to the USB interface)
  iii)   A modem (to serial port)
  iv)   A microphone (to the mike jack of the host PC)

Different sensors viz. touch sensor, fire and smoke sensor, intruder sensor, emergency switches etc along with the signal conditioning circuitry are located at different places within the perimeter under coverage. The signals are carried up to the signal conditioning card.

The algorithm to the corresponding is provided below step-wise of how it will operate.

Step 1: Firstly the sensors viz. touch, smoke, fire, intruder sensing set-up and an emergency switch were set at different locations as inputs.

Step 2: The sensor outputs were fed to local actuating devices viz. siren/hooter and a lighting device.

Step 3: The sensor outputs were also fed to a PC through serial ports (the PC must be provided with internet connectivity).

Step 4: As soon as multiple/any of the serial ports receive/s any signal from sensor end/s, it triggers CC cameras to turn on for future references and investigations..

Step 5: As part of preventive and protective measure, through internetwork and EPABX connectivity, it makes call to certain pre fed phone numbers corresponding to the concerned station and one definite call to the owner.

Step 6: If the called person/station is found busy, it immediately leaves a audio message and keeps on redialing until the call gets answered.

The working f the entire system is elaborated in the flowchart diagram provided below.
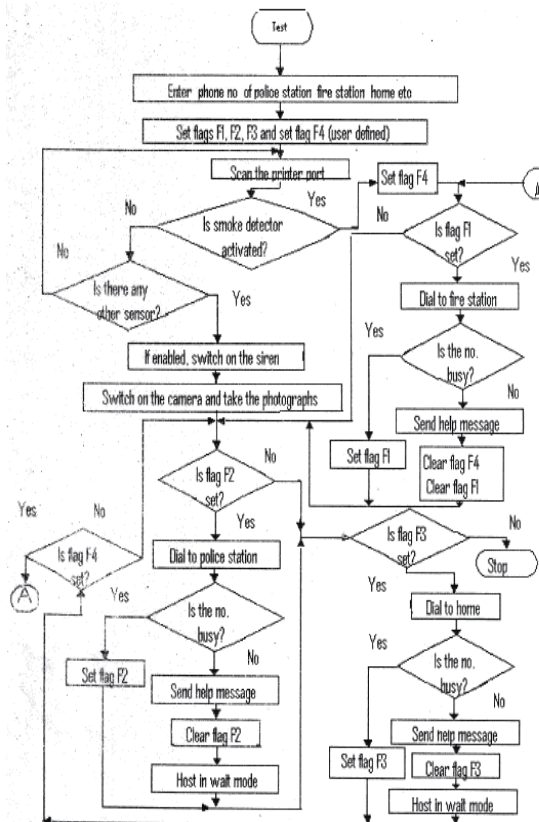

Fig 1: Flowchart Diagram of the Security System

There are two block diagrams given below each representing the input section and output section of the above mentioned system respectively.
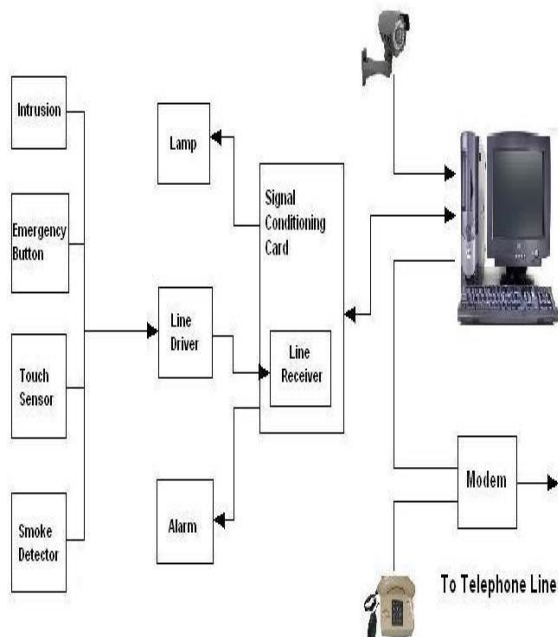

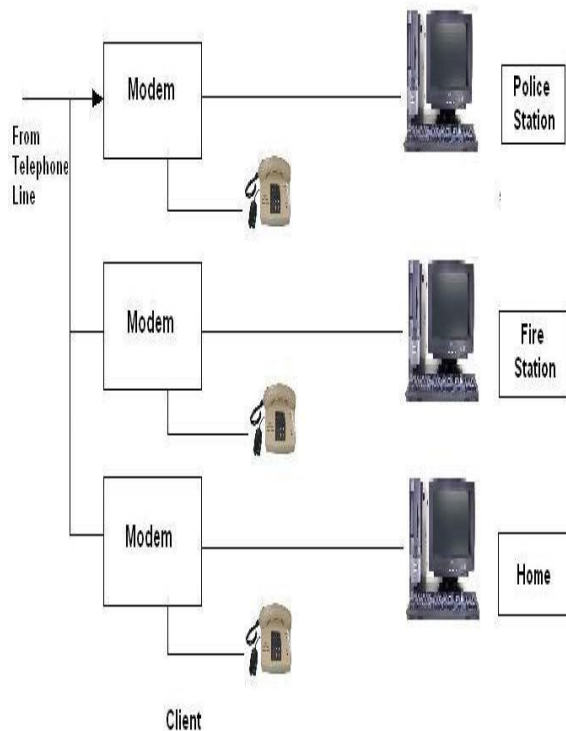Fig. 2: Input Section of the Security System.

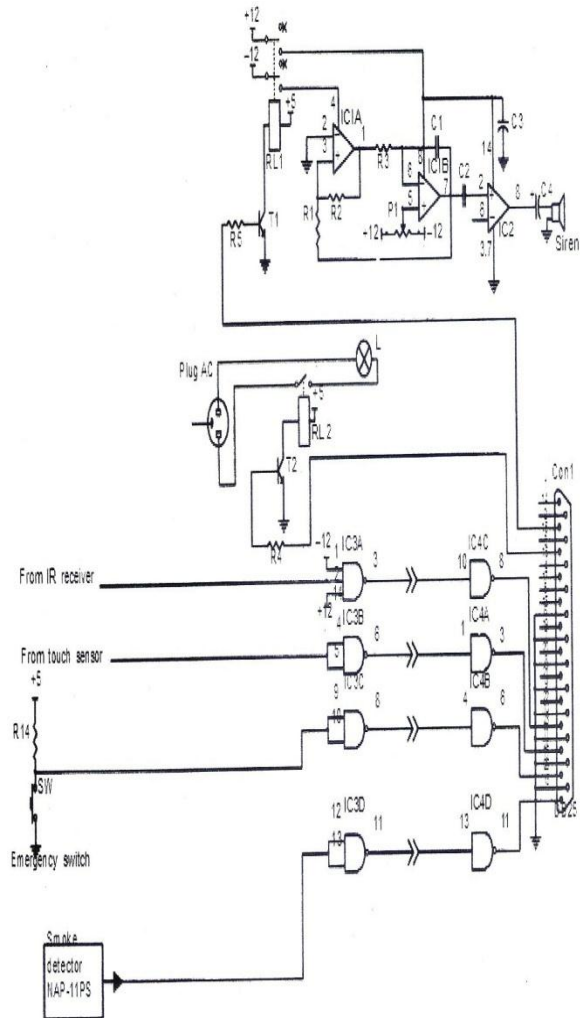Fig. 3: Output Section of the Security System.
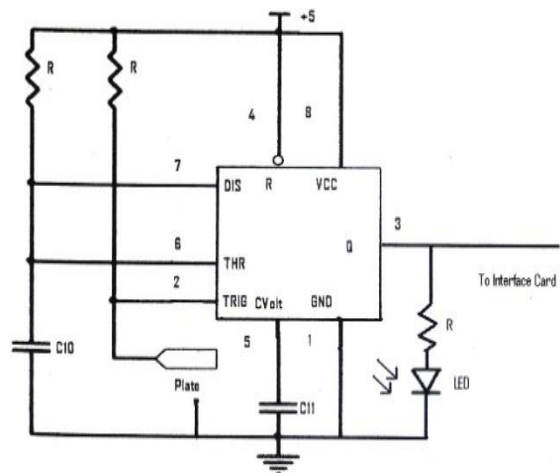

Fig. 4: Interface card circuit diagram.

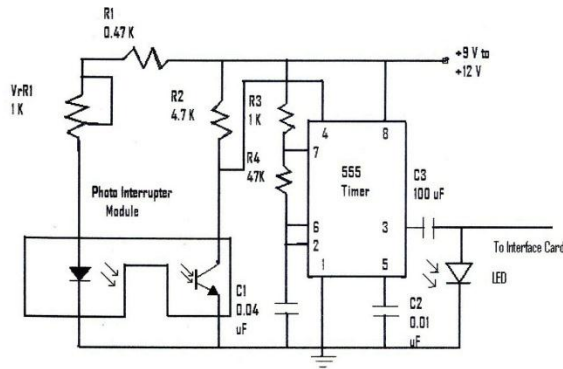Fig. 5: Touch Sensor Circuit diagram

Fig. 6: Smoke Detector Circuit diagram
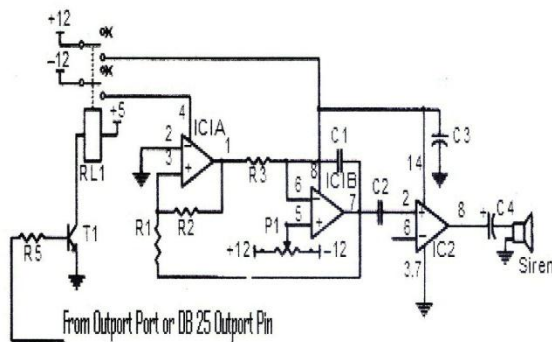

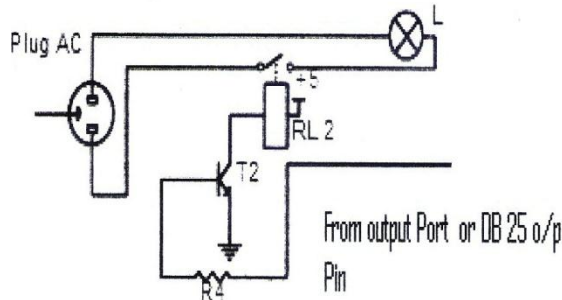Fig. 7: Circuit diagram of Alarm/Hooter.

Fig. 8: Circuit diagram of Relay based Lamp

IV.   CONCLUSION

The system is built and tested for intrusion, touch sensor, smoke and fire sensor and also with emergency switch. The system is installed in a computer centre, supplemented with the use of intercom (EPABX) phone lines. However, the sensitivity and response of the smoke detector needs to be improved. The system works properly providing desired output in case any of the sensors gets activated. The software used are Visual Studio and Turbo C++ and the coding language

used are VC++ and VB with .NET framework. This security system is suitable for the places like financial institutes, banks, educational institutes, research facilities and any other sector that may need security of prime level. It can also happen that the intruder may disconnect telephonic connection before breaching in. To avoid such situations, the above discussed security system can be connected through some wireless network i.e interfacing the PC with mobile phone. That part of work is still under consideration and requires further investigation about its feasibility.

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