

Smart ATM Security System

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Abstract- the idea of Designing and implementing a security based ATM theft project is born with the observation in our real life incidents happening in around us. This project deals with prevention of ATM theft robbery, so to overcome the drawback founded in exciting technology in our society. Whenever robbery occurs, vibration sensor is used, which senses vibration produced from ATM machine. Once the vibration is sensed the beep sound will occur from the buzzer. And also if ATM system got fire then fire sensor is used to sense the fire, once the fire sensor senses fire then Buzzer starts to beep. RTC is used to capture the robber occurrence time and send the robbery occurrence time with the message to the nearby police station and corresponding bank through GSM.

Index Terms— ATM: Automated Teller Machine, GSM: Global system for mobile communication, Microcontroller (PIC18F4550), Vibration sensors.

I. INTRODUCTION

In today's technically advanced world, autonomous systems are gaining rapid popularity. As the social computerization and automation has been increased and the ATM and credit card has been installed and spread out to simplify the activity for financial activity, the banking activity has been simplified, however the crime related with financial organization has been increased in proportion to the ratio of spread out of automation and devices. Those crimes for the financial 2003, little bit decreased in 2004, and then increased again from year 2005. In the year of 2007, 212,530 of theft and 4,439 of robber cases are happened, and 269,410 of theft and 4,409 of robber cases are happened in year 2010 and also in the year 2011, 270,109 of theft and 4,509 of robber cases are happened. The cases of theft and robber have been increased gradually during past 12 years. Among the crime for financial organization, the cases of theft and robber have very high proportion of over 90% and the crime for the ATM has been increased because the external ATM has been increased and it is suggest the method of rapid reaction and minimization of loss by detecting the ATM machine at real-time when it has been stolen can be found through GSM technology. So by using the GSM technology, Vibration sensor external ATM machine can be predicted. In this project buzzer is used to give signal for corresponding bank and police station.

II. HARDWARE DESCRIPTION

A. Vibration Sensor

In engineering, the application of vibration sensors are widely used, so it caused by a high degree of importance about its research and development in the world. At present, with the development of science and technology, the short

comings of vibration sensor continue to be overcome measurement; accuracy and increasing the sensitivity of range of application are increasingly being used.

B. Fire Alarm System

An automatic fire alarm system is designed to detect the unwanted presence of fire by monitoring environmental changes associated with combustion. In general, a fire alarm system is classified as either automatically actuated, manually actuated or both. Automatic fire alarm systems are intended to notify the building occupants to evacuate in the event of fire or other emergency, report the event to an off-premises location in order to summon emergency services, and to prepare the structure and associated systems to control the spread of fire and smoke.

C. GSM

GSM (Global System for Mobile communication) is a digital mobile telephony system that is widely used in Europe and other parts of the world. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz.

III. LITERATURE REVIEW

Parameter	An enhanced ATM security system	Design and implementation of ATM theft monitoring system	Smart ATM Security system using FPR, GSM and GPS	Our Project
Micro-controller	ARM-7	ARM-7	Not used	PIC 18F4550
Sensor	No Sensor	Fire and Alarm Sensor	IR Sensor	Fire and vibration sensor
Power Supply	Battery	Built in power supply	Battery	External power supply

IV. BLOCK DIAGRAM

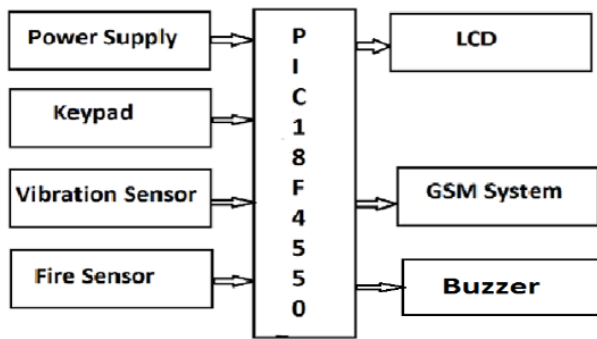


Fig. Block Diagram

V. WORKING

In this project we used LCD, Keypad, Buzzer, GSM and some sensors i.e. fire and vibration sensor. When ATM system starts, LCD will glow with WELCOME message, when any unauthorized person tries to break the ATM system vibration sensor senses the force exerted on the body of that security system, then vibration sensor sends signal to buzzer and buzzer gives the signal by beeping which works as alarm and also it sends information to nearest police station by messaging through GSM. Keypad is used for entering the input by the user and it will be displayed on the LCD which is used for displaying purpose. All the system parts are managed systematically for proper function of different information acquired for the user also keeping all the securities. When the system got fire then fire sensor senses this hazardous situation and then it will send the signal to buzzer. After receiving the signal, the buzzer will start sounding (beeping) which will work as an alarm to the outsider. A GSM modem is a wireless modem that works with a GSM Wireless network. Wireless modem behaves

like a dial-up modem .GSM modem supports an extended set of AT commands .with the extended AT commands, we can do things like reading, writing, sending SMS and monitoring the signal strength. PIC18F4550 is advanced microcontroller. The vibration sensor is powered by its own 9V battery and is isolated from positive and ground of microcontroller the microcontroller is powered by 5 volts battery. The microcontroller serial lines RX and TX are connected to a 16x2 LCD. We have also interfaced fire sensor with the microcontroller. In case of fire microcontroller will sense input from fire sensor and send a signal to the buzzer and alarm system. The Buzzer starts beeping and the alarm will turn ON. A message will be sent to the nearest police station in order to protect the ATM.

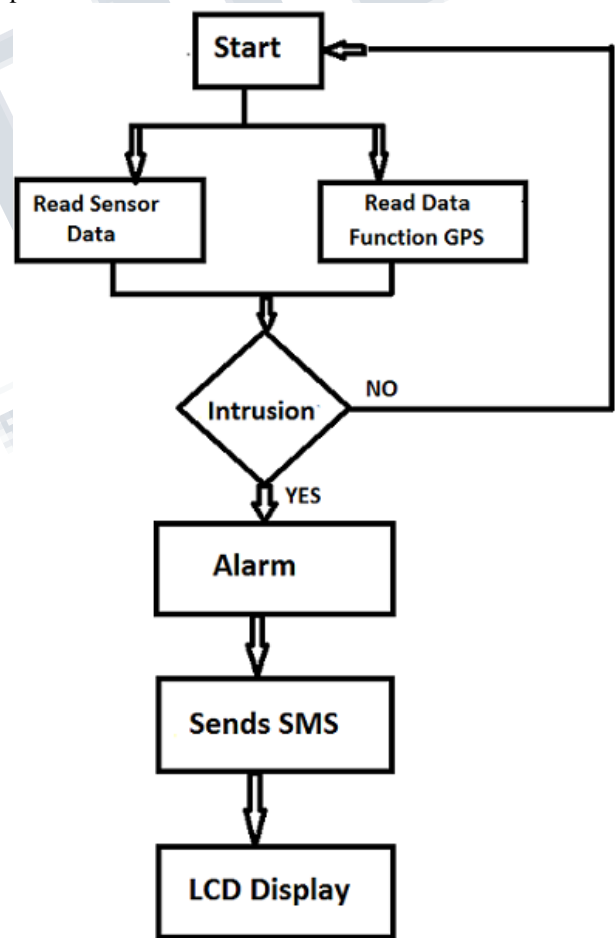


Fig. Flow Chart

VI. RESULT

The project is all about protecting ATM system from robbers or any authorized person. Software part of the project is done in MPLAB and simulation was done using Proteus. We successfully implemented an ATM security system which is capable of protecting an ATM from an unauthorized access and also from hazardous condition such as fire. The results were satisfactory when we went about with the hardware implementation part which was done on PCB. The project can be extended to a higher security level by introducing the concept of finger biometric. Biometric authentication technology will help in the problem solving of person's biometric data is undeniably connected to the owners is non transferrable and we unique for every individual. The system can compare scans to records stored in central or local data base or even on a smart card. These techniques are very useful for avoiding the fraud in ATM system. Higher security level can be achieved by also introducing a sensor which will sense a person entering an ATM and will not allow more than one person to enter the ATM system.

1. after starting of ATM security system:-

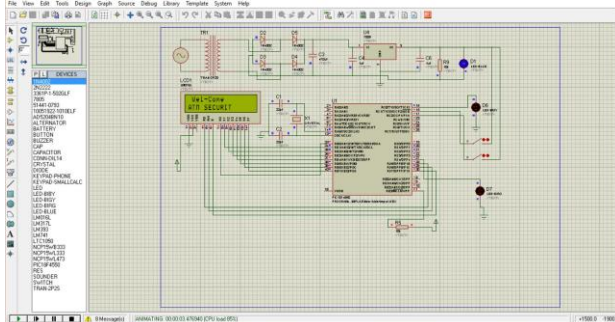


Fig.[a] When the system is ON

The microcontroller will take 5V from the power supply. A 5V supply will also be given to LCD display through microcontroller. When the system will be turned on, the microcontroller will get turned on and a 5V will be given to LCD through microcontroller and the LCD display will turn ON. A message will be displayed on LCD `_WELCOME` 'ATM security'. A crystal oscillator is used as a frequency generator for microcontroller.

2. If ATM system got fire:-

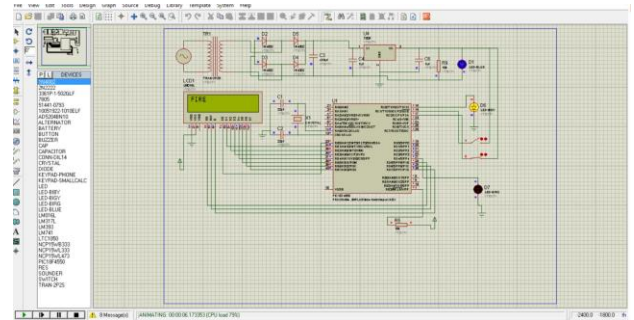


Fig.1 [b] System Sense Fire

When fire will occur, the fire sensor will sense it and will send signal to microcontroller. The signal from the sensor will be received by microcontroller and it will process the signal accordingly and will send the signal to LED or buzzer. LED will glow and a message will be displayed on LCD `—FIRE!` so that the authority will understand that fire has occurred and so measures will be taken to stop it.

3. Detecting Vibration:-

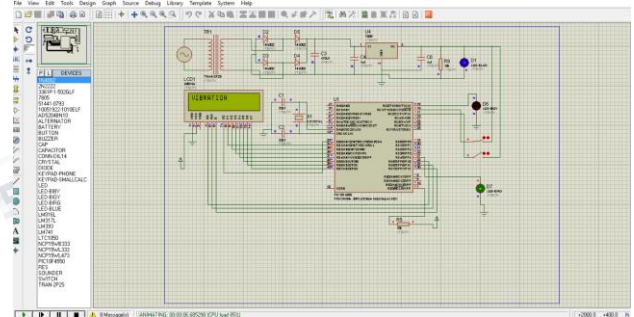


Fig.1 [c] System Sense Vibration

When any unauthorized person will try to break the ATM system with 1k Newton force, the vibration sensor inside the ATM will sense the vibration and will send a signal to the microcontroller. The signal from the sensor will be received by microcontroller and it will process the signal accordingly and will send the signal to LED or buzzer. LED will glow and a message will be displayed on LCD `—VIBRATION!` so that the authority will understand that someone is trying to break the system and some measures will be taken to avoid it. The Vibration sensor used in the project is SW-420.

4. Hardware:-

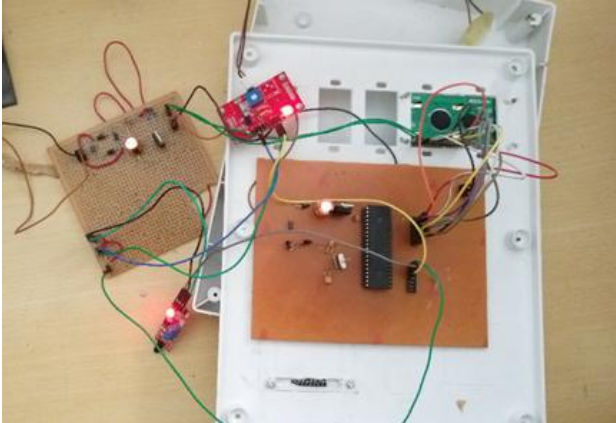


Fig.2 Module of System

Hardware is implemented on single sided PCB. A single sided PCB was taken and the layout of the project was printed on it using glass paper. After that itching was done and the connections were established after drilling process was done. The components were mounted as per our Proteus design and the system was successfully implemented.

VII. CONCLUSION

By using this antitheft ATM machine, robberies of ATM machine can be overcome; and the theft can be caught easily. With the development of sensor technology, vibration sensors in the form will be varied, through the extensive application of electronic technology to achieve high overall performance further. Vibration sensors will play an increasingly important role in scientific research and automates production process, and its development will profoundly affect the development of national economy and national defense science and technology.

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