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Advanced Security System for ATM with Tracking & SMS Indication

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Abstract:
The inspiration for our project is got from newspapers and issues which are happening in our routine life. Nowadays stealing of ATM is too much increased so due to that we are just trying to find out solution for it. At some ATM centers there is no availability of security man, due to it some circumferences get chance at there. Police investigation exposed that nevertheless the bank had employed guards for round-the-clock duty, the night time guards in no way turned up. Besides, the police say, rather than setting up or fixing the ATM device to the ground, the financial institution had kept it on a desk like a TV arranged, creating it much easier for that robbers. At present thieves are not just stealing the rupees from ATM but they take away the whole cash box so because of it the security of ATMs failed to stop them, so we want to find out how we can make that cash box safe as much as possible and also will apply some security systems if we will get that something going wrong there. Nowadays money is the important thing for all the human being so that protection of it is also very important. Concentrating just on these we have choose this project.

Key words: GSM, Microcontroller, GPS, ATM intusion, ATM theft, Sensors

1. Introduction

When the thief has been rush-in ATM cabin He tries to break password firstly, if he fail in it he try to beak down or hole in money chamber. As the part of the security vibration sensor is there. beyond certain vibration limit, the vibration is detected and message will be send by controller to authority GSM base station & the buzzer or light indication is appear around the ATM cabin, this is end of first security system.

In the second step of the security system the pressure sensor or call as limit switch is use. if thief is try to pull-up the ATM the pressure on limit switch is decrease & switch is pull-up the detection is detected by controller & send message again to authority, as soon as signal is detected the locking system lock the door of the ATM cabin.

If the thief is protecting it self in above two step of security & break the ATM cabinet glass door. & take-out whole ATM on heavy vehicle, then controller circuitry in ATM will send the tracking position to GSM on terms of altitude & longitude. & tracking ATM around the world. The use controller IC is 89VS1RD2.AT-commands used in GSM system for tracking purpose & for strikes to the authority.

1.1. Problem Formulation

ATM theft, it appears, is this recession's hottest crime. There were more than 100 instances of teller machine robberies in India alone in 2010. The thieves have snatched or attempted to make off with ATMs 28 times in the past year. That's up from 2 cases of the crime in the year before. In Atlanta, which has also seen a spike in ATM crime, as many as 35 machines have disappeared this year. As this is very big problem of safety of government money. So, we have decided to improve our present security system. In this security system GSM is used to protect ATM.

Figure 1: ATM robberies

2. Methodology

In this system of "Advanced Security system for ATM with Tracking & SMS indication" there is a interface of different sensors, GPS Transreceiver,GSM Module,Door locking System, Buzzer and light indication is interfaces with each other via a semi purpose pcb,the communication between the microcontroller and other components of the system takes place serially. Microcontroller continuosly receives data fromsensors or switches and GPS module,and generate signals accordingly prefetching program,the GSM module generate AT commands and send message to authority or police.
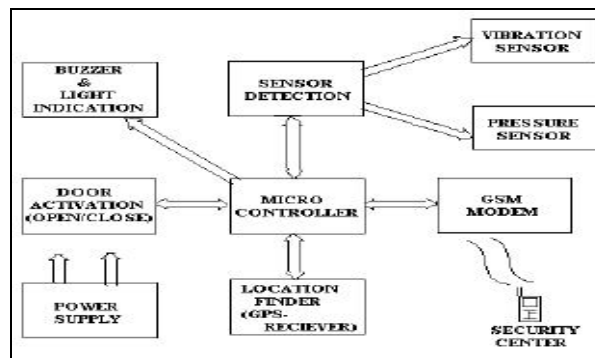
3. System Architecture

Figure 2: System Block diagram

3.1. GSM Modem

GSM (Global System for Mobile Communications) is world's most famous Mobile platform. Mobile phones with SIM cards use GSM technology to help you communicate with your family, friends and business associates.

GSM(Global System for Mobile Communications, originally Groupe Special Mobile), is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phone.The GSM Modem supports popular "AT" command set so that users can develop applications quickly. The product has SIM card holder to which activated SIM card is inserted for normal use. The power to this unit can be given from UPS to provide uninterrupted operation. This product provides great feasibility for devices in remote location to stay connected which otherwise would not have been possible where telephone line do not exist.
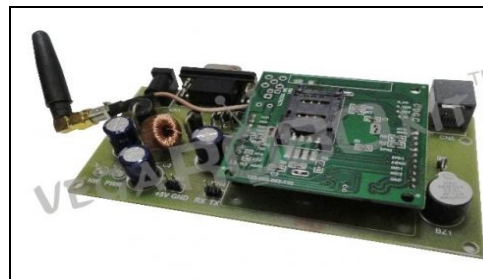

Figure 3: GSM Modem

3.2. Microcontroller 8051

- The Atmel 89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash programmable and erasable read only memory (PEROM)The Atmel 89C51 device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set and pin out.
- The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer.
- By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C51 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications. The Atmel 89C51 provides the following standard features: 4K Bytes of Flash, 128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, a five vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator and clock circuitry.

Figure 4: Pin configuration of 8051

3.3. GPS Transreceiver

To determine the exact location of car GPS module Receiver GR89 has been used. It is a small size low weight and low power consumption device. Some technical details are as under;

It has 49 MHz processor, 20 Channel GPS receiver, It Supports NMEA-0183 v2.2 data protocol: SiRF binary code. It has 4Mbit integrated program Flash and ARM7TDMI processor. It sends location to GSM module to include in SMS via Microcontroller.
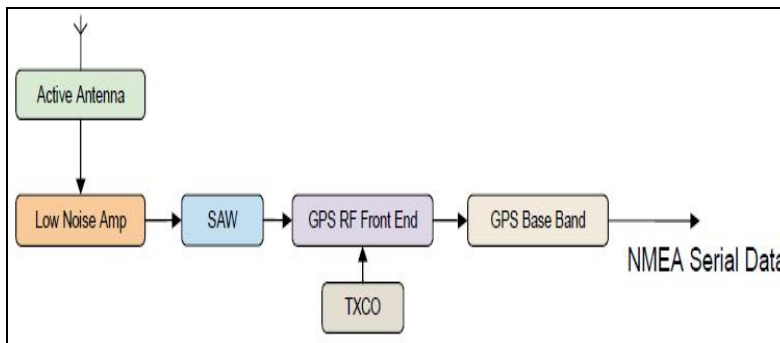

Figure 5: Block diagram of GPS

3.4. Sensors/ Limit Switch

There are so many sensors available in market. Limit switches are being utilized for this project. Reason for using mercury switch was its working. Mercury switch is also called Mercury tilt switch. It works as; mercury is sealed in glass Mercury is constantly forced to go to the lowest point in bulb by gravity. When it flows towards electrical contacts and touches them and causes close switch. And when it is on. Whenever someone tries to open the ATM door, bonnet or trunk, switch is placed in such a manner that it will close and send the alarm signal to Microprocessor.

3.5. Solenoid Valve/Relay & Motor Displacements

Relays are being used to trigger an action; if an intrusion is being made the owner of the car can prompt an action from a SMS. Relays used works as a switching unit. One end of the relay is connected to the microcontroller while the other end is being connected to the battery, gear unit or the supply line to the engine. An action can be taken depending upon the user. Microcontroller will generate a signal depending upon the message signal send by the owner of the car to the microcontroller via GSM module. The power required to the system is being drawn from the battery of the vehicle; a rheostat is being deployed in between the battery and the.
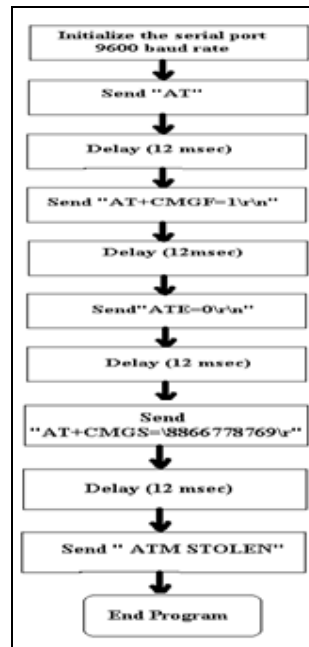
Figure 6: Flow control of GSM commands

4. Programming Interface

Assembly language used for purpose of programming the microcontroller. On intrusion, the numbers to which the message is to be sent and what message is to be sent and in return when the owner of the vehicle sends an SMS then what kind of an action is to taken on what microcontroller takes its decision on the basis of the signals it The general flow of the system from system to client and form client to the system has been described through flow charts.

4.1. Assembly Language

Assembly language is the best option to program microcontroller. Its remembering exact location of data on physical memory Assembly Language utilizes 'mnemonic codes' or 'symbols'.

4.2. Software Interaction with GSM Module SIM300

When microcontroller receives alarm signal from sensor, it SIM300CZ to generate intrusion/theft alert SMS including commands are used. Table of AT-commands shows some of the commands implemented using this system.
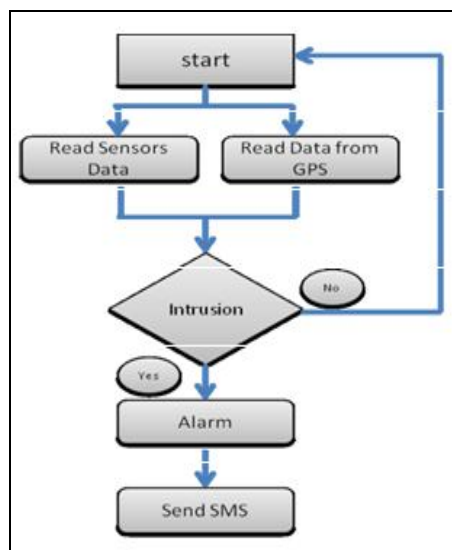

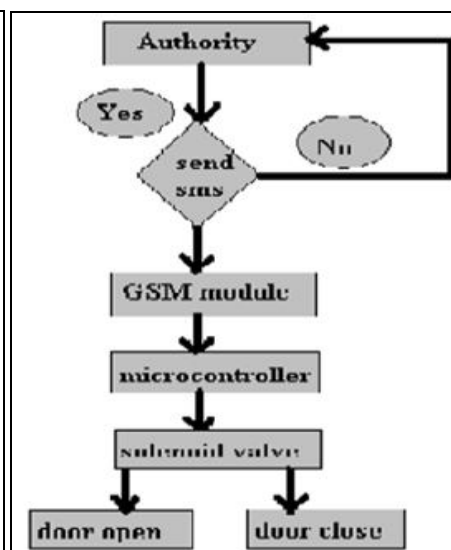
Figure 7: Flow control from unit to Authority   Figure 8: Flow control from authority to unit

5. AT Commands

AT commands, also called Hayes AT commands, are based on the Hayes Modem de facto standard, ATTENTION Commands for modems. They are used to communicate with your modem. These commands modify your modem's behavior or instruct the modem to do something specific, such as dialing a telephone number. The "AT" refers to getting the Attention of your modem.

To send a command to modem, we need to start a terminal program such as Windows Hyper Terminal .No matter which terminal program you use, it should be configured to communicate with the COM port that your modem is attached to.

You then type commands in the Terminal window. The modem executes the command and responds appropriately. One set of AT commands will identify your modem and version information.

Command	Description
AT	Check if the serial interface with GSM modem is working.
ATE0	Turn echo off, less traffic on serial line.
AT+CNMI	Display of new incoming SMS.
AT+CPMS	Selection of SMS memory.
AT+CMGF	SMS string format, how they are compressed
AT+CMGR	Read new message from a given memory location.
AT+CMGS	Send message to a given recipient.
AT+CMGD	Delete message.

Table 1: Basic AT-commands

6. Building a Generic Model and It's Implementation

Complete circuit with all hardware was integrated. For our prototype model instead of a big ATM we used a small Demo of which had doors, body and cash box like other ATM. The limit switches/sensors were placed at the under body, trunk and doors. After activating the system, when one would try to An alarm would ring and a message will be immediately generated to the owner of the ATM. In return the owner can take an action, which in our case we locking the door unit of the ATM. The system will continuously to trigger a message after every 30 seconds an action is taken.

7. Conclusion and Future Work

In this project an advance and cost effective approach for ATM security has been proposed. It can be installed in the ATM at some hidden place so that it cannot be approache by thieves. GSM and GPS technology has been utilized. It sends alarm signal to the owner of ATM via SMS, and through SMS ATM can be jammed. After that system still sends location update SMS after every 30 sec until system is disabled. Proposed system is distinctive in many ways from existing ATM intrusion and theft control systems; already used systems are either very expensive or ineffective from distance. It is reliable, inexpensive and appropriate design. In future this system can be implemented in all ATM's, and police numbers can also be added for intrusion notification. For further enhancements sensors with better performance level can be deployed to increase the efficiency and performance level of the system.

8. Acknowledgment

9. References

1. AT commands: http://www.simcom-sh.com
2. Alarm security: http://www.bullhornatmalarm.com/Bull_Horn_ATM_Alarm.pdf
3. ABB: http://www.Microtechnologies.netpdfnewsMicro_ABB.pdf
4. GSM modem: http://www.nowsms.com/faq/what-is-a-gsm-modem
5. Interfacing of GSM with Microcontroller:
6. http://www.electronicsbasedprojects4u.blogspot.in/2012/03/interfacing-gsm-module-with-8051.html
7. "Data signaling functions for a cellular mobile telephone system" Hachenburg, B. Holm and J. Smith, IEEE Trans.
8. Sharma, K. Kumar, and S. Viq, "DTMF Based Remote Control.
9. National motor vehicle theft reduction conference 2000, Conference Papers