

Review on Protection of ATM against Theft

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Abstract: In this paper we are going to explain what are the present techniques available for Protecting ATM against theft. The ATM machines are not safe since security provided traditionally were either by using RFID reader or by using security guard outside the ATM. The Proposed techniques are based on Sensors like PIR (Passive Infrared) Sensor, ADXL335 Accelerometer, FSR (Force Sensitive Resistor) to detect motion, heat, change in orientation, sudden acceleration, force, and vibration. Embedded web Server to obtain the Live video footage of ATM using Raspberry pi for controlling purpose and an ATM tracker to track the Location of ATM in case if it is Stolen. so the proposed system removes the drawback of manual controlling camera module and door

Keywords: Raspberry pi ,RFID Reader ,Sensors ,ATM Tracker, Embedded Web Server.

1. INTRODUCTION

Currently, ATM security is given to the transactions only. There are many systems available for securing transactions, but there is no particular system to secure ATM machine. So there is a necessity to implement a system which monitors and control the room where ATM machines are placed.

This security is provided in 3 ways:

- Level1 security: The first level consists of a fingerprints reader placed at the entrance of ATM machine used to identify whether the user is authorized.

- Level2 security: once the person enters into the atm, we will monitor the persons behavior using embedded web server video footage and . Whenever thieves tries to steal complete ATM machine, then accelerometer sends a notification to raspberry pi and buzzer get start ringing. Also the shutter of ATM center is closed using DC motor. For informing the police about this threat, an email will be send to the nearby police station. The shutter will only be opened only when the authorized person opens the shutter. Camera is used for surveillance of ATM center from a control room on the computer through Wi-Fi. Here router is connected inside the ATM center for connecting number of devices
- Level3: In case if ATM is stolen it can be traced using ATM Tracker

2. OVERVIEW OF THREE METHODS

2.1 Method 1:

The design of proposed system is divided into two parts. The first consists of a fingerprints reader placed at the entrance of ATM machine used to identify the user is authorized. The second part consists of Raspberry Pi module which is placed inside ATM centre for capturing real-time video and controlling purpose.

The proposed system block diagram is shown in Fig.1.

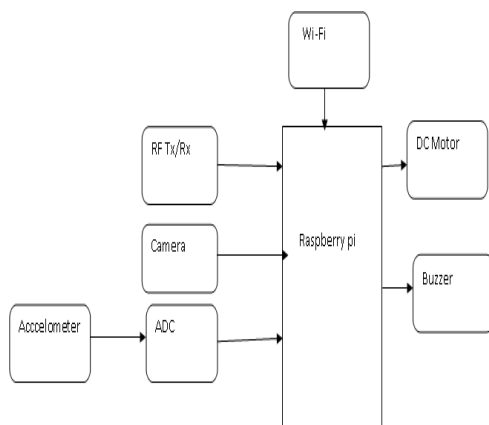
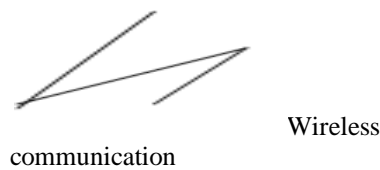
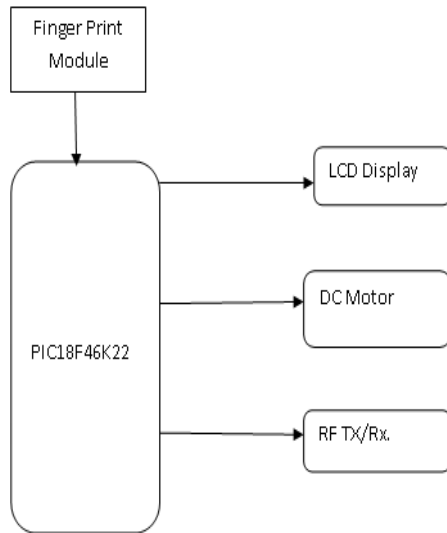


Fig 1: Proposed System Diagram

There are two modules first module is placed outside the door and the second module is placed inside the ATM center. The first module consists of the fingerprint which is used for authentication purpose. When customer open account in the bank, bank will collect the fingerprint of each customer and store it in the fingerprint module. Whenever customer wants to enter in ATM center for transaction, fingerprint module is there for authentication. If fingerprint matches with the database template, then the door will be open. Else it will remain close. The second module contains camera, accelerometer, Wi-Fi module, RF module, buzzer, and DC motor interfaced with Raspberry Pi. Whenever thieves tries to steal complete ATM machine, then accelerometer sends a notification to raspberry pi and buzzer get start ringing.

Also the shutter of ATM center is closed using DC motor. For informing the police about this threat, an email will be send to the nearby police station. The shutter will only be opened only when the authorized person opens the shutter. Camera is used for surveillance of ATM center from a control room on the computer through Wi-Fi. Here router is connected inside the ATM center for connecting number of devices. These connected devices used for monitoring the ATM center. Use of wireless communication is an advantage of this system. The computer and Raspberry Pi is connected using Wi-Fi router. RF transceiver is used for switching ON/OFF AC whenever any user enters in the ATM center. This system is real-time monitoring system and efficient as compared to the previous systems.[1]

2.2 Method 2:

The proposed system unlike other systems uses a number of smart sensors to detect an attack and avert it, like PIR (Passive Infrared) Sensor, ADXL335 Accelerometer, FSR (Force

Sensitive Resistor) to detect motion, heat, change in orientation, sudden acceleration, force, and vibration. The controller used here is the popular ATMEGA-328 from ATMEL. This system is built around the ATMEGA328 microcontroller which belongs to the ATMEL family. The system continuously monitors its surroundings by sensing temperature changes, force, and orientation of the ATM using the sensors

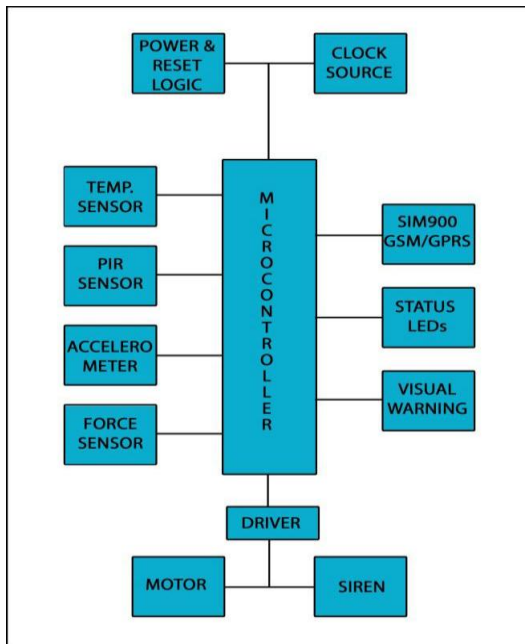


Fig 2: The basic block diagram of the proposed system

Characteristics of the system :

1. Continuous monitoring of the sensors in the system so that any burglary attempt is detected.
2. Informing the controller that the sensors have been triggered and necessary safety actions are due.
3. Siren: The controller then activates the alarm system through the driver to dissuade the burglary attempt.

4. Warning: The controller then sends an SMS alert and call alert to officials informing the break in happening.

5. Shutter locking: The controller then activates the motor locking down the kiosk and the culprits are locked inside. The ATM is safe when no sensors are triggered, and no action needs to be taken, but when any of the sensors are triggered then the ATM is vulnerable to attacks and necessary safety action should be taken. Here we activate the siren; visual warning and we alert the designated persons by SMS and call using GSM module.[2]

2.3 Method 3

ATM Tracker Protects the ATM and Cash against attack. Tracks the stolen machine for Police to pinpoint the location for capture and recovery.

ATMs, whether standalone or drive up, or small ATM machines located in pharmacies, convenience stores, outside events, etc. are targeted by criminals. Thieves use trucks, nearby construction equipment or hand carts to steal the ATM with the goal of taking the cash inside.

ATM Tracker is a fully automatic solution that silently and immediately notifies local law enforcement of the pull-out crime as it occurs. ATM Tracker will track the ATM, cash and criminals during their escape. This highly effective solution has recovered 95% of all stolen ATM cash and has led to criminal apprehension. If a Theft Occurs ATM Tracker automatically triggers a silent theft alert upon motion. The GPS tracking information is accessed by local law enforcement allowing safe pursuit and apprehension.

3. FEATURES AND ADVANTAGES

- Small, covert design
- Automatically detects tilt and/or motion
- Internal and external GSM and GPS antennas
- Tracking location updates every 6 seconds
- Conserves battery when power is lost
- Options available via input and output connections

- Device health check reported to server daily
- Secure website for live tracking
- Text and email alerts sent if ATM is attacked
- Uses smart technology to store data if cellular signal is lost
- RF to pinpoint final device location
- Protects the machine and cash
- Fully automatic
- Quick and accurate location data
- Multiple location technologies
- Configurable trigger options
- External devices can be connected for additional attack response

4. CONCLUSION

In this paper we have shown different methods and techniques which can be used to protect an ATM against theft. The security features were enhanced for protection of ATM's when compared to previous systems, because of the latest technologies like smart sensors

,GSM/GPRS modem and the real time video of the ATM centre can be monitored through webserver.ATM is also installed with ATM tracker to track lost ATM, which can make ATM better safe from theft.

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