

“Implementation of ATM security system using GSM and MEMS”

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ABSTRACT

In this paper is designed for providing security using MEMS Accelerometer. The output of MEMS device is given to ADC circuit to convert the analog values to digital which is inbuilt for LPC2148 microcontroller. Whenever the accelerometer is disturbed it gives signal to controller. MEMS are miniaturized structures, sensors, actuators, and microelectronics. Micro sensors and micro actuators are appropriately categorized as “transducers”, which are defined as devices that convert energy from one form to another. In the case of micro sensors, the device typically converts a measured mechanical signal into an electrical signal. The LPC2148 are based on a 16/32 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, together with 128/512 kilobytes of embedded high speed flash memory. A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb Mode reduces code by more than 30% with minimal performance penalty. With their compact 64 pin package, low power consumption, various 32-bit timers, 4- channel 10-bit ADC, USB POBT, PWM channels and 46 GPIO lines with up to 9 external interrupt pins these microcontrollers are particularly suitable for industrial control, medical systems, access control and point-of-sale.

KEYWORDS – *Microcontoller LPC2148, MEMS, GSM, LCD display, Driver circuit.*

Introduction

Security is prime concern in our day-to-day life. Every one wants to be as much as secure as to be possible. An access control systems forms a vital link in a security chain. The microcontroller based digital lock presented here is an access control system that allows only authorized persons to access a restricted area. This system is best suitable for corporate offices, ATMs and home security. Here we are using GSM modem for security purpose. The microcontroller processes this information and this processed information is sent to the user/owner using GSM modem.

The paper ‘ATM security system using GSM and MEMS module’ is designed using MEMS technology. According to this technology the communication takes place between two devices MEMS and microcontroller. The MEMS is a sensor device which identifies the tilt produced by the ATM machine due to the irregular movement that occur during theft. This paper makes best use of MEMS as a sensor device which identifies the tilt produced by the ATM machine due to the irregular movement that occur. The paper basically consists of a MEMS sensor which identifies the tilt

by the machine and activates the microcontroller to start the following sequence in which shutting the door using stepper motor and sending SMS to vigilance system using GSM is involved

Literature reviews

The technological advancement in the field of electronics and telecommunication has brought more and more arrangements in the domestic and industrial environment. Security systems can avoid the unauthorized entry of peoples into the protected area and it stores the details about the authorized peopled entered in the area on the computer through a wireless transmitter. Up gradations in this system can be done easily to improve the efficiency of the system. Security systems are the demands of the day, which helps to avoid theft and avoids unauthorized entry of peoples into the restricted area.

Fingerprint recognition technology is allow access to only those whose fingerprints you choose. These eliminates the need for keeping track of keys or remembering a combination password, or PIN. It

can only be opened when an authorized user is present. Global system for mobile communication is mainly used for sending or receiving data such as voice and message. In this security system GSM plays a important role. Through the use of GSM the user can receive random number. This random number can be used as password, this also another security for system.

The main purpose of RFID and GSM based ATM money transfer prototype system is for making of secured ATM transactions by not revealing ATM password to users. Account holder will send password through mobile to the GSM modem present in the architecture. The theme of this system is we use RFID tag as an ATM card, first we show RFID tag to the RFID reader then it identifies the account holder information and sends a message to the predefined mobile number or customer's mobile number. GSM modem will send message to account holder that please enter your four digits password numbers. Now he sends his secured password to ATM center number through SMS. If he enters correct password then he will receive return SMS as please enter your amount. If password is wrong we get return SMS as please enter your correct password. If we entered more amount than available balance in our account, then we receive SMS as you are having insufficient money in your account. If the transaction is Successful we receive money and dc motor will rotate in the project architecture.

Author	Year	Review
John Shepherd-Barron	1960	ATM system
Dallas	1965	First password ATM system
A Juels	2005	RFID Security system for ATM
X. Liu and L. A. Bailey	2009	RFID and GSM based ATM system
Schouten and Jacobs	2009	Fingerprint based ATM system
Ankit Anil Agarwal, Saurabh Kumar Sultania	2011	RFID Based ATM security
Amruthy and Reddy	2012	fingerprint system for ATM security

Recent technology

Conventional security systems used either knowledge based methods (passwords or PIN), and token-based methods (passport, driver license, ID card) and were prone to fraud because PIN numbers could be forgotten or hacked and the tokens could be lost, duplicated or stolen. To address the need for robust, reliable, and foolproof personal identification, authentication systems will necessarily require a biometric component. Personal safes are revolutionary locking storage cases that open with just the touch of your finger. These products are designed as secure storage for medications, jewelry, weapons, documents, and other valuable or potentially harmful items.

BLOCK DIAGRAM.

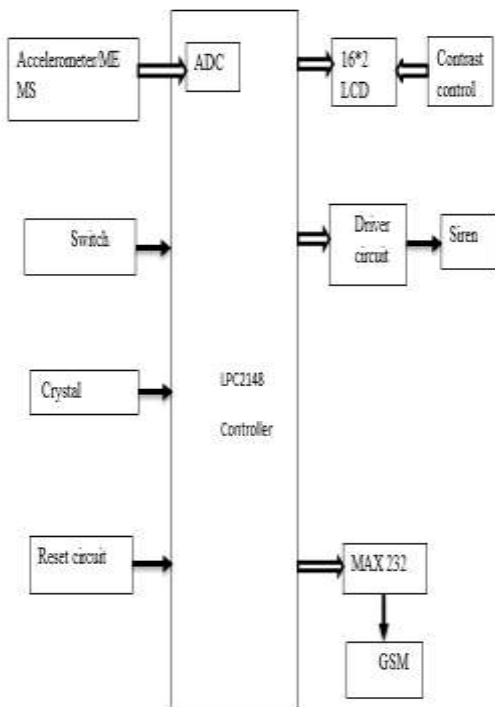


Figure 1 : Block diagram of ATM system

In this system, the MEMS sensor is placed in the upper or lower panel of the ATM machine, when a thief tries to open the machine he has to break the panel and open either the upper panel or lower panel. When he does so the MEMS sensor will be activated as it reads the tilt produced while lifting the panel, this will activate the microcontroller. As the microcontroller is activated it then has to start a sequence which should stop the thief from running away from the machine, for this purpose we need to shut the door, in order to shut the door we are using a stepper motor, also we have to alert the vigilance system here we are using GSM to send the SMS

The hardware involved in this project is a Power Supply, a LCD to display the concerned information, a GSM is interfaced to the Microcontroller through MAX 232, MEMS is interfaced through ADC. While execution, the tilt identified by the MEMS activates the microcontroller. The microcontroller then starts the following sequence, it gives command to shut down the door in order to avoid the thief to run away and also a SMS is sent to the vigilance system to alert them so that they can approach to the place as soon as possible to catch the burglar.

Advantages

- This system is easy to implement.
- In this system GSM is used for longer range communication.
- This system is easy to use.
- Not as sensitive to weather/ environmental conditions.
- System cost is less.

Applications

- Security purpose.
- ATM security systems.
- Home security.
- Industrial security

Conclusion

In this paper we have designed an effective implementation of security system that can monitor an ATM centers, with Accelerometer sensors, to implement the system which is more secure by using GSM module. It sends the alert message to the authenticated person. The thief tries to open the machine the MEMS is activated this gives signal to the microcontroller which shuts the door and alerts the vigilance system.

References

- [1] Armenian Luther George Simjian(. 17 April in 1920) "Automatic Teller Machine The history of computing Project". Thocp.net.
- [2] John Adrian Shepherd-Barron, British inventor(1960), "Development the cash machine Automated Teller Machine or ATM".
- [3] Robert Morris(1961) invented "password system with privacy".
- [4] A. Juels(28 September 2005), "RFID Security and Privacy: A Reasearch Survey," RSA Laboratories.
- [5] The X. Liu and L. A. Bailey(2009), is developed "Enhancing Security and Privacy in Biometrics-based Authentication Systems, IBM Systems Journal, vol. 40, no. 3, pp. 614-634.
- [6] The Ankit Anil Agarwal, Saurabh Kumar Sultania, Gourav Jaiswal, Prateek Jain(2011), "RFID Based ATM security is developed".
- [7] P.K. Amurthy and M.S. Redddy(2012), "Implementation of ATM Security by Using Fingerprint recognition and GSM",

International Journal of Electronics
Communication and Computer Engineering
vol.3, no. 1, pp. 83-86,.

- [8] M.Gayathri, P.Selvakumari, R.Brindha
“Fingerprint and GSM based Security
System” pp. 342–351.