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Improved Version of Customers Security at ATM Using Noise Level Detector & PIR Sensor

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Abstract: ATM (Automated teller machine) is used by the customers to do a financial transactions like cash with drawls, balance checking etc. as we know that ATM are placed everywhere in all the locations including shopping malls, airports, colleges hospitals, restaurants and were ever necessary and required. Nowadays the main targets of the criminals are ATM and when the customers are using ATM. they are attacked by the criminals. ATM are usually secured by the security guards but they are not enough to provide a security to the customers. The proposed system over comes the problems that is faced by a customers at the ATM centre. In this system main component are PIR sensor and Noise detector. PIR sensors are used for detection of motion and door operation through the microcontroller and noise detector are used for detecting the noise of higher DB and noise level detection.

Keywords: Noise level detector, PIR sensor, Emergency switch, Stepper motor, GSM module

I. INTRODUCTION

Customers are using ATM for the financial transactions. By using ATM customer can credit or deposit money to their bank accounts. The customers use an ATM to do wide variety of transactions like cash with drawls, credit mobile phones, and check balance in their account. ATM with drawl currency is usually different from which bank account it is denominated and money can be converted to an official exchange rate. Foreign travellers often use an ATM as it provides the best possible exchange rate for them. ATM is widely used for the purpose of exchange rates.

ATM installations are of 2 types on &off premises. ATM are widely used hence they are placed in all places such as shopping malls, Colleges, Hospitals, Airports, Petrol/Gas Stations, Restaurants.

ATM is used for the cash withdrawals /financial transactions so the main target of the criminals is ATM. Many customers are been attacked by the criminals while using ATM.

A incident took place in Bangalore capital city of Karnataka .when a lady was using an ATM booth .she was brutally attacked inside by the criminal and was injured .one more incident took place in Bangalore where the bank manager was attacked inside a ATM kiosk in the day time by the criminal, by a machine –wielding youth. Security concerns have been triggered by the lethal attack on woman customers in an ATM booth in Bangalore.

ATM is very advanced &they are real time operating system that does all multi functions that complement a bank branches &thus they are more expensive. ATM are typically more advanced, multi-function machines that complement a bank branch's capabilities, and thus they are more expensive. So protecting the ATM is also a major concern.

II. METHODOLOGY OF CUSTOMERS SECURITY AT ATM'S

There are three main parts included in this topic. The main functional block for the proposed design is Design Architecture. The proposed Hardware Speciation will give the details about the components used in the design& proposed Software Development gives the detail design of the software part.

A. Design of The Proposed Architecture

The block diagram of a proposed architecture is shown in the below figure1 Four inputs are the main components of the system & four main components are PIR sensors, noise detector, power supply &emergency switch, the output of the proposed system is given to the LCD, buzzer/alarm, level indicator GSM and stepper motor.

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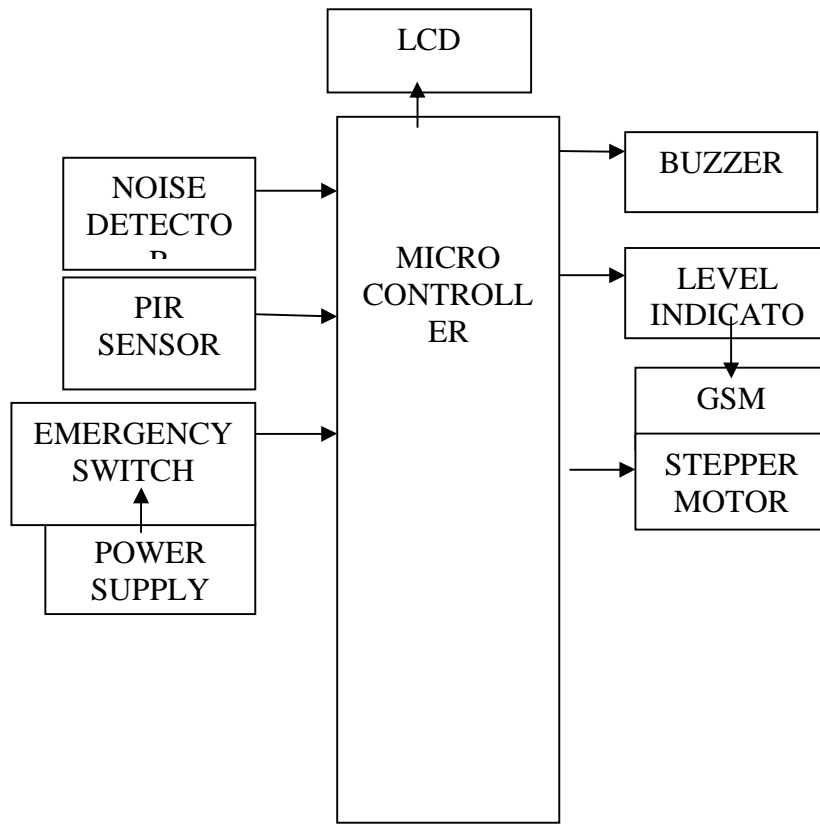


Fig1.Block Diagram

Presence of human, noise level detection and automatic operation of door are the process that are managed and controlled by the PIR sensor, Noise level indicator and stepper motor. LCD are used to display the operational status of the proposed system

B. Hardware Specification Used In The Proposed System

Hardware used in the proposed system are categories based on the input, output & controller.

The four inputs used in the system are noise detector, power supply, and emergency switch & PIR sensor. The power supply is used to supply the power to the LCD (fig.6), GSM (fig.7), Stepper Motor (fig.8) and Buzzer (fig.9). The output of the proposed system is given to the LCD, Buzzer, GSM & Stepper Motor and they are connected to the microcontroller. which is controlled by the software. The LCD is used to display the operational status of the proposed system.

C. Software development

For the proposed design is using keil μ vision software. The keil μ vision software needs a program to execute & operate the process associated a blend with the proposed design. There are several stages added in the software development. the system is started by the sensor, sensor that determines the operation or process of the system.

The sensors will be started by analyzing the motion & operation of the stepper motor. When there is an increase in the noise level more than 60db. the noise level detector will detect it and sends the signal to microcontroller and buzzer will get triggered through the relay operation, hence the stepper motor starts to operate the GSM module and GSM module sends the message to the concerned bank branches and to the nearest police station.

The complete operational flow of the system is shown in figure 2

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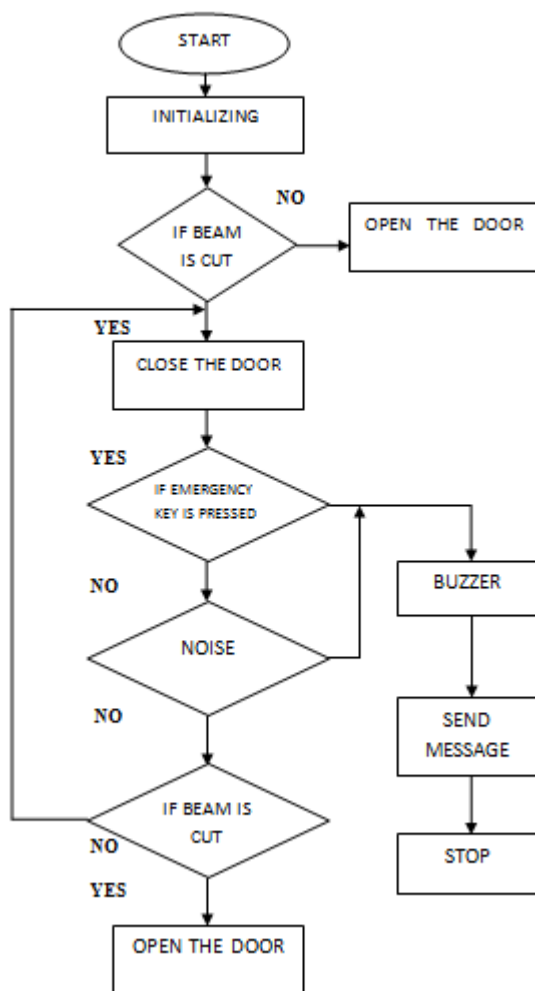


Fig.2. Flow Chart for the ATM'S security system

III. WORKING PRINCIPLE OF THE PROPOSED SYSTEM

This working principle is used to summarize the working of the proposed system .The circuit diagram of Motion detector is shown in the fig, 3

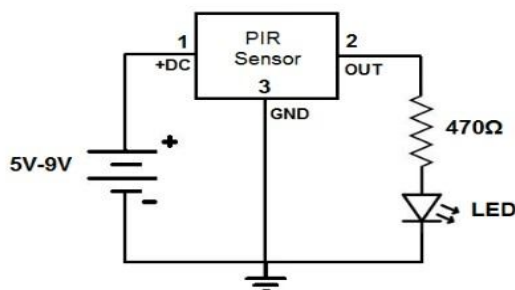


Fig 3 Motion detector circuit

PIR sensor detects the changes depending upon the amount of infrared radiations affect up on it, PIR sensor mainly depends on the surface characteristics of the object & temperature.

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When a human passes in front of wall/background the sensor will sense the temperature of that point & it will rise in the view of sensor field. It will rise from room temperature to body temperature & back again. Sensor triggers & detects when it converts the incoming infrared radiation into the change in output voltage.

PIR Sensor is shown in fig.4



Fig.4 PIR Sensor

Condenser microphone senses the noise & it will convert the noise signal into the electrical signal. The operation of the condenser is mainly dependent on the variations of the internal capacitance. The signal obtained from transistor Q1 is amplified by transistor Q3 and Q4 triggers the relay. The triggering of the relay enables signal to micro controller.

A. Db levels for different noise level

Microphones are used to convert sound pressure to audio voltage (volts). 1 pascal is 94 dbpsl as established by international standard. 94 dbpsl is taken as the reference point for specifying the sensitivity of microphone. Sensitivity is given by the ratio of analog output voltage and is given digital output value to input pressure & they are used for any kind of specification microphone.

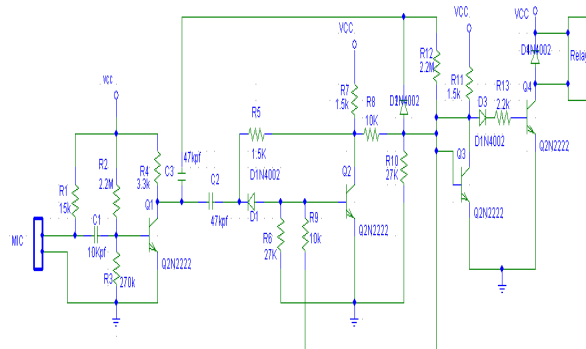


Fig.5 Noise Detector

The Logarithmic units of sensitivity are in db volts, it specifies how many volts of O/P signal can be given for SPL decibels:

$$Sensitivity_{dBV} = 20 \times \log_{10} \left(\frac{Sensitivity_{mV/Pa}}{Output_{AREF}} \right)$$

A linear unit of analog microphone sensitivity is mv/pa that can be articulated in logarithmically in decibels. Output AREF is the 1000mv/pa (1vpa) reference to ratio of O/P. Compared to moving coil (1.5-3mv/pa) condenser microphones are sensitive.

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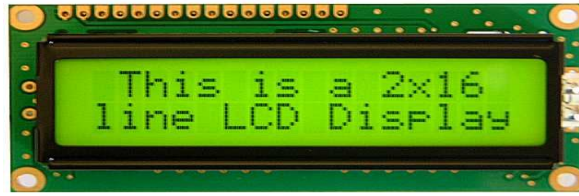


Fig.6 LCD Display



Fig.7 GSM Module



Fig.8 Stepper Motor



Fig.9 Buzzer

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IV. CONCLUSION

The main advantages of this system are that it provides very good security to ATM users at emergency cases. The GSM provided will send the information to the nearby police station and to the particular bank when there is any problem inside the ATM. It will also avoid harassment which is very common these days. It reduces man power which in turn reduces cost. Low cost microcontroller & PIR sensor are used that provides the better saving in term of cost & the components used are very minimal. . This security system is also applicable in banks, home security, jewellery shops and office places.

V. ACKNOWLEDGMENT

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