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Thief Detection Using Flex Sensor based on GSM

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Abstract: *The title of our project is Thief detection system using flex sensor based on GSM technology. It involves microcontroller 89S52, ADC 0809, LCD, flex sensor, IR sensor, limit switch, etc which is being used to prevent and control the theft. The developed system is an embedded system based on GSM technology. The system is installed on the door. An interfacing GSM modem is also connected to the microcontroller to send the message to the owner's mobile. The main objective of this project is to protect the locker from any unauthorized access, as the door is open message is displayed on LCD that theft is detected and the same message is send to the owner by Global System for Mobile (GSM) communication technology. This system deals with the concept of any type of security. The main concept in this design is introducing the flex sensor into the embedded system, flex sensor changes its resistance as it bends. The entire designed unit is on a single board.*

I. Introduction

In these days, thefts are increasing at an alarming rate all over the world, So to escape from these thieves most of the banks have started using the theft control systems. This system is very suitable to banks because we hear about bank robbery. The commercially available anti-theft CCTV cameras are very expensive. Here, we make an attempt to develop a system based on 8051 microcontroller and operated using GSM technology. The system is a very simple and low cost bank theft control embedded system. The Global System for Mobile communications (GSM) is the most popular and accepted standard for mobile phones in the world established in 1982 and it operates in 900 MHz frequency. Over billion people use GSM service across the world. The utility of the GSM standard makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs significantly from its predecessors in both signaling and speech clarity, as its channels is digitized. It means that the GSM system is now considered as a third generation (3G) mobile communication system.

Now an introduction to this system. This system is based on microcontroller and GSM modem. Main security of this system is switch. No one can enter the room without enabling the switch. If anyone tries to enter and come in front of door the person is detected by IR sensor, thus we will get a message on register mobile number. There will be LCD screen (16x2) for displaying the condition of system. Information through SMS is main benefit of our system. If door is open by unauthorized person the flex sensor gets bend and its voltage gets changed. Thus we get message on registered mobile number and the same message is display on the LCD. Also we have use limit switch as a parallel system for flex sensor. If theft is detected then it shows that "theft detected by sensor".

In this way we can detect the theft using flex sensor in any domestic ,educational or commercial application.

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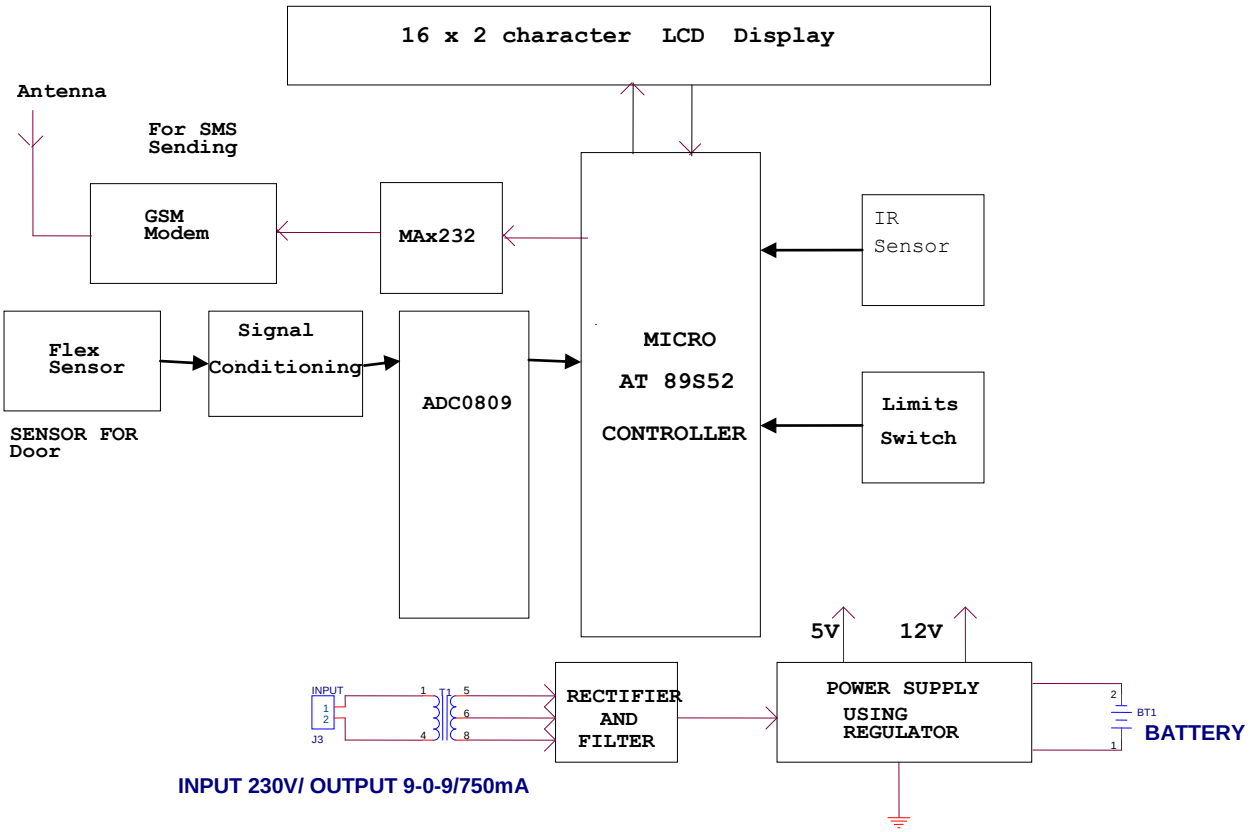
II. Block Diagram



III. Circuit Operation

CASE I : When obstacle is detected by IR.

When there is any obstacle present infront of IR sensor at a distance of 15cm from it, a detected signal logic 0 is sent to the microprocessor and then to the GSM. LCD displays a message "Thief detected by IR sensor ". Also a message is sent to the programmed mobile number through GSM.

CASE II : When the door is opened.

1) As the door gets opened the limit switch also gets open at that instant. Thus a logic 1 signal is sent by switch to the controller and a message "Thief detected by Limit Switch" is displayed on the LCD. At the same time a message is sent to the programmed mobile number.

2) When the door is opened the flex sensor gets bend causing in change in the resistance of the flex sensor and thus change in the voltage. As the output of flex is in analog form it is first given to ADC for the conversion. This digital signal is provided to microprocessor which displays message "Theft detected by flex sensor" and also a message is sent on the programmed mobile number.

CASE III : When no thief is detected.

When there is no interference in the system , no message is displayed on the LCD and no message is sent through the GSM to the owner i.e.system is healthy.

4 Advantages

1. Better security.
2. Low cost.
3. Distance of GSM is not restricted.
4.

5 Disadvantages

1. Resistance of the flex changes w.r.t temperature.
2. Complex programming.

6 Applications

1. To prevent paper leakage.
2. In all types of locker security

IV. Conclusion

This is unique method of designing and assembly a low cost , compact theft control system for bank. This instrument is an ultimate threat to the bank robbers. By installing this system in bank we can prevent the bank robbery, since it is based on GSM technology.

Referances :

[1]. Let Us C -Fifth Edition -Yashavant P. Kanetkar
[2]. The 8051 Microcontroller and Embedded Systems Using Assembly - Muhammad Ali Mazidi ;Janice Gillispie Mazidi ;Rolin D. McKinlay