ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 9, Issue 6, June 2022

SECURITY BASED ATM ROBBERY PREVENTION

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ABSTRACT

The objective of this Project is to develop an embedded system, which is used for ATM security applications. In this Project, if any disturbance takes place for the ATM machine that disturbance signal is sensed and send through microcontroller to GSM, so that the ATM door is automatically closed. Then microcontroller will send the message, by alerting the surrounding area using buzzer, at the same time total data will be uploaded in web page using GSM and puts alert message to concern person also.

In the same way, if any fire accident occurred the controller puts a message to concern person and uploads same data in web page using GSM. It also counts how many persons are entering into the ATM centre. This concept is not only a single ATM center. We can consider this ATM center as node1 (like node1, node2, node3……. Etc) are connected to web page through GSM module (ESP 8266). So that if there is any disturbance or any fire accident in any node we can get the area information through GSM to the web page along with buzzer.

Keywords: ATM, GSM, PIR Sensor, ARDUINO, Vibration Sensor, BLYNK platform.

1. INTRODUCTION

The Internet of Things (GSM) is that the network of physical objects or "things" embedded with electronics, software, sensors, and network property that permit these objects to gather and exchange information. GSM permits objects to be detected and controlled remotely across existing network infrastructure, making opportunities for additional direct integration between the physical world and computer-based systems, and leading to improved efficiency, accuracy and economic profit. "Things," (ATMs) were 1st introduced in 1939. Nowadays, concerning three million units area unit put in worldwide. Because the variety of ATM units increase, the machines area unit susceptible to hacker attacks, fraud, robberies and security breaches. Within the past, the ATM machines main purpose was to deliver cash

However, ATM machines have become additional difficult, and that they serve varied functions, so changing into a high priority target to robbers and hackers. Trendy ATM machines are enforced with high security protection measures. They work beneath advanced systems and networks to perform transactions. The information processed by ATMs area unit sometimes encrypted, however hackers will use discreet hacking devices to hack accounts and withdraw the account's balance. As an alternate, unskilled robbers threaten bank patrons with a weapon to loot their withdrawn cash or account.

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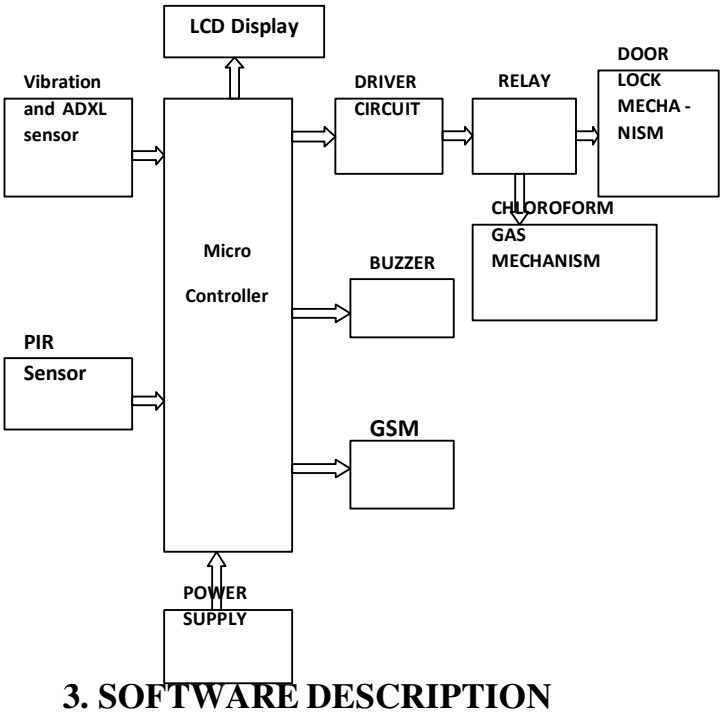
2. SYSTEM ARCHITECTURE



3. SOFTWARE DESCRIPTION

PIR sensor
ARDUINO
Vibration sensor
ADXL

3.1 PIR Sensor

Passive infra-red sensor (PIR sensor) is an electronic sensor that calculate infra-red (IR) light emitting from objects in its field of view. They are most frequently used in PIR motion sensors. All objects with a temperature overhead absolute zero radiate thermal energy in the form of radiation. Generally this radiation isn't visible to human eye because it radiates at infrared wavelengths, but it can be detected by electronic devices planed for such a purpose. A PIR motion sensor is used to detect movement of people, animals, or other objects. They are often used in burglar alarms and automatically activated lightning devices. They are also called as "PID", for "Passive Infra-red Detector". The below fig 6.1 shows that PIR (Passive infra-red) sensor comprise of a pyro electric element along with the circuits to check the responsiveness and delay.

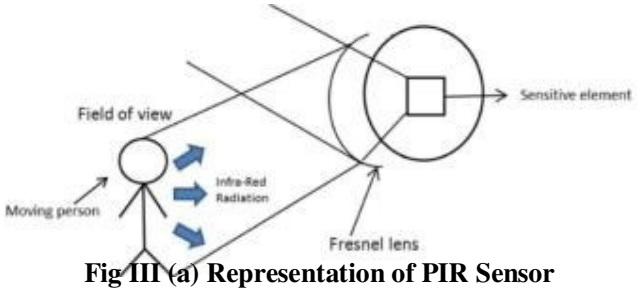


Fig III (a) Representation of PIR Sensor

PIR sensor sense the infrared radiation discharged or reflected from an object. The PIR sensors are used with Fresnel lenses to intensify and appearance their FOV (Field of View) Fresnel lenses are adequate energy collectors. In most cases an array of Fresnel lenses is used to split the FOV into various distinct fields to increase the sensitivity and efficiency of the sensor.

3.2 ARDUINO

ARDUINO is an open-source hardware and software company, project and user community that designs and manufactures single boar microcontrollers and microcontroller kits for building digital devices. Its products are licensed under the GNU Lesser General Public License(LGPL) or the GNU General Public License (GPL), permitting the manufacture of ARDUINO boards and software distribution by anyone. ARDUINO boards are available commercially in preassembled form or as do-it-yourself (DIY) kits.

ARDUINO board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or breadboards (shields) and other circuits.

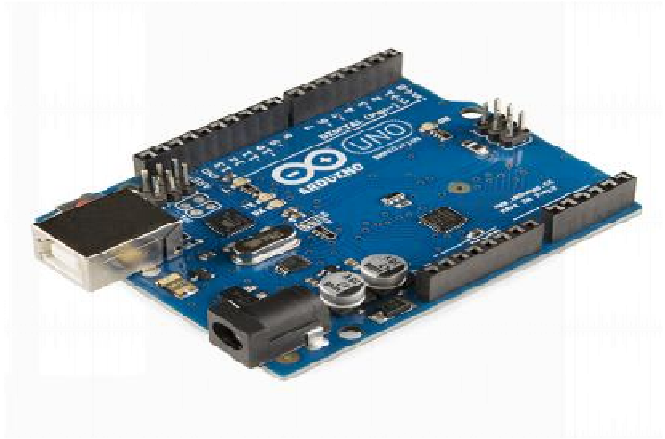


Fig III (b) ARDUINO

3.3 Vibration Sensors

Vibration sensors can be useful for monitoring the condition of rotating machinery, where overheating or excessive vibration could indicate excessive loading, inadequate lubrication, or bearing wear. Such sensors are also utilized in geophysical and applications requiring accelerometers. Piezoelectric

vibration sensors used for detecting vibration from various vibration sources are generally classified into two large types, resonant type and non resonant type.

3.4 ADXL

An accelerometer is a device that measure proper acceleration. The proper acceleration measured by an accelerometer is not necessarily the coordinate acceleration (rate of change of velocity). Instead, the accelerometer sees the acceleration associated with the phenomenon of weight experienced by any test mass at rest in the frame of reference of the accelerometer device. For example, an accelerometer at rest on the surface of the earth will measure an acceleration g= 9.81 m/s^2straight upwards, due to its weight. By contrast, accelerometers in free fall or at rest in outer space will measure zero. Another term for the type of acceleration that accelerometers can measure is g-force acceleration.

Working Principle:

An accelerometer Sensor is an electromechanical device that measures acceleration forces. These forces may be static or dynamic which is caused by moving or vibrating the accelerometer. By measuring the amount of static acceleration due to gravity, you can find out the angle the device is tilted at with respect to the earth. By sensing the amount of dynamic acceleration, you can analyze the way the device is moving.

There are different types of accelerometers:

Piezo electric accelerometer
Piezo resistive accelerometer
Strain gage accelerometer

4. HARDWARE DESCRIPTION

Arduino IDE
Blynk GSM Platform

4.1 Arduino IDE

ARDUINO IDE is an open source software that is mainly used for writing and compiling the code into the ARDUINO Module. It is an official ARDUINO software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process. It is easily available for operating systems like MAC, Windows and Linux which runs on the Java Platform that comes with inbuilt functions and commands that play a vital role for debugging, editing and compiling the code in the environment.

A range of ARDUINO modules available including ARDUINO Uno, ARDUINO Mega, ARDUINO Leonardo, ARDUINO Micro and many more. Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code. The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded in the controller on the board. [6] discussed about Intelligent Sensor Network for Vehicle Maintenance System. Modern automobiles are no longer mere mechanical devices; they are pervasively monitored through various sensor networks & using integrated circuits and microprocessor based design and control techniques while this transformation has driven major advancements in efficiency and safety.

4.2 BLYNK GSM PLATFORM

BLYNK is a Platform with IOS and Android apps to control ARDUINO, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for our project by simply dragging and dropping widgets. [4] discussed about Positioning Of a Vehicle in a Combined Indoor-Outdoor Scenario, The development in technology has given us all sophistications but equal amounts of threats too. This has brought us an urge to bring a complete security system that monitors an object continuously.

There are three major components in the platform:

BLYNK App - allows to you create amazing interfaces for your projects using various widgets we provide.

BLYNK Server - responsible for all the communications between the smart phone and hardware. You can use our BLYNK Cloud or run your private BLYNK server locally. Its open- source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.

BLYNK Libraries - for all the popular hardware platforms - enable communication with the server and process all the incoming and out coming commands.

Now imagine, every time you press a Button in the BLYNK app, the message travels to the BLYNK Cloud, where it magically finds its way to your hardware. It works the same in the opposite direction and everything happens in a BLYNK of an eye.

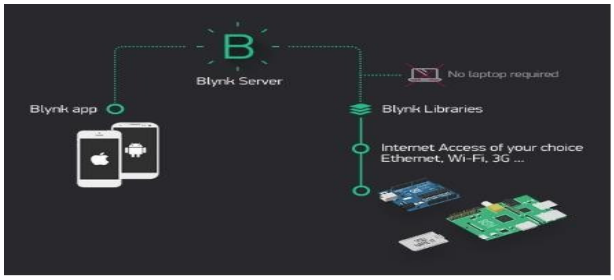


Fig IV (a) BLYNK Cloud Architecture

5. IMPLEMENTATION RESULT

The Implementation of Advanced ATM theft avoidance System is brought into world with the perception of ATM wrong doing occurring far and wide. This paper manages the counteractive action of ATM wrongdoing. At whatever point burglary happens, MEMS module is present to detect crime happening at ATM machine. Proposed framework is done by microcontroller based installed framework designed for constant information gathered utilizing a MEMS module. When the theft happens this, designed system automatically alerts alarm such as buzzer, dc motor control gate, GSM sends SMS to authorized person and the status is displayed in LCD to monitor. Simultaneously this framework additionally manages the wellbeing of the client by cautioning the encompassing individuals and close-by police headquarters at whatever point the client is in risky circumstance.

6. CONCLUSION

Based on the results obtained, the objective of implementing ATM security system using ARDUINO and vibration sensor has been achieved. This project is used to provide security to ATM. Whenever a person tries to distract the ATM, the sensor which senses the vibrations & send a signal to the microcontroller. Once the controller receives signal, it locks the door of ATM room by sending signal to the dc motor and sprinkler sprinkles the chloroform to make the thief unconscious. At the same time, the buzzer also gets activated. Simultaneously, the controller will send a message to an authorized person through GSM modem and the door is made to open only after entering the password.

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