ADVANCED LOCKER SECURITY SYSTEM

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ABSTRACT

The purpose of this paper is to provide a secured locker security system based on RFID, PASSWORD, CONVEYER and GSM technology which can be organized in bank, secured offices and homes. This system allows authentic person only can be recovered money from locker. The implemented locker security system based on RFID, PASSWORD and GSM technology containing automatic movement of lockers system which can be easilyactivate, authenticate, and validate the user in real time for secured locker access. The RFID, PASSWORD, GSM and HEAT SENSOR provides the advantage of high security than other systems. In general terms, RFID is an object or person identifierusing a radio frequency transmission. In electronic terms RFID is an electronic method of exchanging data over radio frequency waves. With RFID technology we can identify, sort, track or detect variety of objects.

*Keywords***:** *RFID, GSM, Conveyer, Microcontroller, Heat sensor.*

I. INTRODUCTION

The main purpose of this paper is to implement a locker system with high security based on RFID, PASSWORD, CONVEYER, GSM and HEAT SENSOR technology which can be organised in banks, offices and other places where high security is required. In this only authorized person can open the locker. The initial security levels are RFID verification and PASSWORD. The After this security verification the details of the person will provided to the security in charge like manager, after that conformation CONVEYER setup will bring only the appropriate locker from the locker to the person. The GSM server send the random password to the customer mobile. The locker can be accessedif the password matches. Otherwise the alarm is on. In addition to this, the heat sensor can access the alarm when anyone try to open the locker by using electrical machine which produce heat.

II. EXISTING SCENARIOS

The locker systems involve manual lock in most of the banks. Whenever the user uses the locker, user should be assisted by the bank employee. It leads to waste of time for both the customer and the employee. Lack of security and the waiting time of the customers are the major drawbacks of such manual lock systems. The person accompanying the customer can be any employee who is free at that instant of time it should be noted. Hence, time is wasted. This can be overcome with the automatic locker system. There are many techniques in which the proposed technology can be implemented. The RFID tags are used in this project which holds the user's information like locker number, username, etc, in the existing project RFID tag read by the RFID reader

will automatically open and close the locker. Hence, security is guaranteedand the customers waiting time is reduced.

III. PROPOSED METHOD

In this proposed method after the password verification for the RFID tag the details of the customer will provided to the manager. The manager authentication Selects the locker and moves it to the opening with the help of the stepper motor. The locker will have keypad for password. By GSM technology the customer receives the random password provided by the server. The locker can be accessed if the password matches otherwise the alarm rang. To avoid theft by using electrical gadgets to break the locker the heat sensor is provided to detect the heat while breaking with alarm

IV. RFID FUNDAMENTALS

RFID is an effective automatic identification technology for variety of objects and person. The most important functionality of RFID is to track the location of the tagged item. The RFID tags can be classified into three major categories which is based on power source, active tags, passive tags, and semi-passive (semi-active) tags. An active tag contains both a radio transmitter, receiver and a battery that is used to power the transceiver. Active tags are more powerful than the passive tags/semi-passive tags. RFID tags can also be classified into two categories: tags with read/write memory, and tags with read-only memory. The tags with read/write memory are more expensive than the tags with read-only memory. RFID tags operate in three frequency ranges: low frequency (LF, 30–500 kHz), high frequency (HF, 10–15MHz), and ultra-high frequency (UHF, 850–950MHz, 2.4–2.5GHz, 5.8GHz). The LF tags are less affected by the presence of fluids or metals when compared to the higher frequency tags. RFID reader is shown in the fig1.

The most important functionality of RFID is the ability to track the location of the tagged item. Typical applications of HF tags are access control and smart cards. RFID smart cards, working at 13.56MHz, are the most commonly used tags.
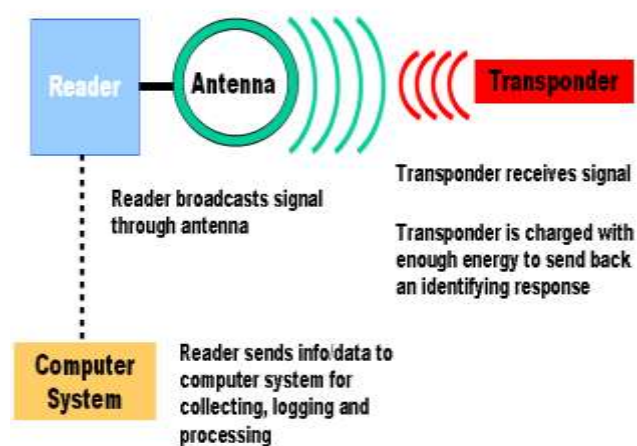

Fig1 RFID Reader

However, UHF tags are severely affected by fluids and metals. UHF tags are more expensive than any other tag. The typical frequency of UHF tags are 868MHz (Europe), 915MHz (USA), 950MHz (Japan), and 2.45GHz The active tag enables higher signal strength and extends communication range up to 100-200m.

V. GSM

GSM (Global System for Mobile communications) is the technology that underpins most of the world's wireless mobile phone networks. GSM is a digital cellular and an open technology used for transmitting mobile voice and data services. GSM operates in the 900MHz to 1.8GHz bands. The supported data transfer speed of GSM is up to9.6kbps.It allows the transmission of basic data services such as SMS. In the current work, GSM module SIM300 is used, it is shown in figure.2. The SIM300 module is a Triband GSM/GPRS solution in a compact plug in module featuring an industry-standard interface.

Features of GSM

- Single supply voltage 3.2v-4.5v
- Typical power consumption in SLEEP Mode: 2.5mA.
- SIM300 tri-band
- MT, MO, CB, text and PDU mode, SMS storage SIM card
- Supported SIM Card: 1.8V, 3V

Figure 2 GSM Modem

VI. STEPPER MOTOR

A stepper motor (or step motor) is a brushless DC electric motor that divides a full rotation into a number of equal steps. The position of the motor can then be commanded to move and hold at one of these steps without any feedback sensor (an open-loop controller), as long as the stepper motor is carefully sized to the appropriate

application. In this project the stepper motor is used to move the locker towards the opening in the room and bring it back to the original position with accuracy

Figure 3Stepper Motor

VII. KEYPAD

The keypad is used to get the password from the customer in two different situations. Initially the RFID tag requires the password. Then the server requires the password to open the locker. In this the 4*4 matrix keypad is used. Since thepasswords are four digit random numbers.

Fig 4Keypad

VIII. LCD DISPLAY

LCD stands for liquid crystal; this is an output device with a limited viewing angle. The LCD is mostly preferred as an output device because of its cost of use and is better with alphabets when compared with a 7-segment LED display. Now a days we have so many kinds of LCD and our application requires a LCD with 2 lines, each line consist of 16 characters, the LCD receives data from the microcontroller and displays the same. It has 8 data lines and 3 control line. LCD has a supply voltage Vcc (+5v) and a GND. This low voltage supply makes the whole device user friendly by showing the balance left in the card. Italso shows the card that is currently being used.
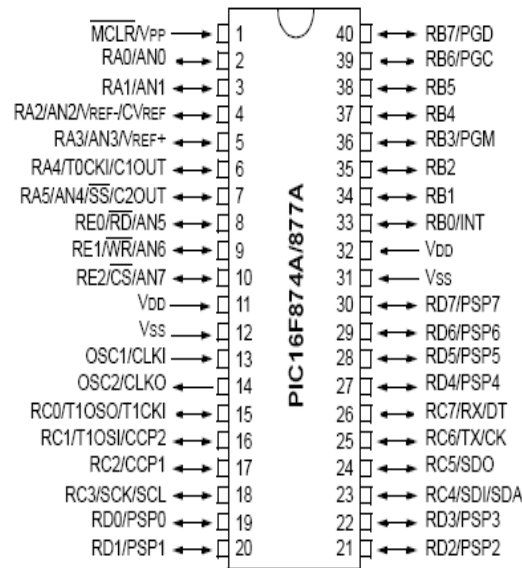
IX. MICROCONTROLLER

Fig 5 PIC16f874A

The security options are controlled by the microcontroller. The operating voltage is 2.0-5.5V with low power consumption. It is fully static design. The operating speed is 20MHZ. This microcontroller is 40 pins dual in line package. It has three timers with high speed. When compared to others it has high efficiency.

X. TEMPERATURE SENSOR

The LM35 series are precision integrated-circuit temperaturesensors, the output voltage of the sensor is linearly proportional tothe Celsius (Centigrade) temperature. The LM35 hasan advantage over linear temperature sensors calibrated in §Kelvin, as the user is not required to subtract a large constantvoltage from its output to obtain convenient Centigradescaling.

Features

- Calibrated directly in § Celsius (Centigrade)
- Linear a 10.0 mV/§C scale factor
- 0.5§C accuracy guarantee able (at a25§C)
- Rated for full b55§ to a150§C range
- Suitable for remote applications
- Low cost due to wafer-level trimming
- Operates from 4 to 30 volts
- Less than 60 mA current drain
- Low self-heating, 0.08§C in still air
- Nonlinearity only g(/4§C typical
- Low impedance output, 0.1 X for 1mA load

XI. BLOCK DIAGRAM

In the given block diagram, the controller of this arrangement is microcontroller PIC16F874A. The initial security levels are controlled by the computer. The keypad reads the password entered. Then the RFID tag is swiped. The RFID reads the customer details if the password is correct. Otherwise it will not allow the process of opening. The computer verification sends the result to the microcontroller.
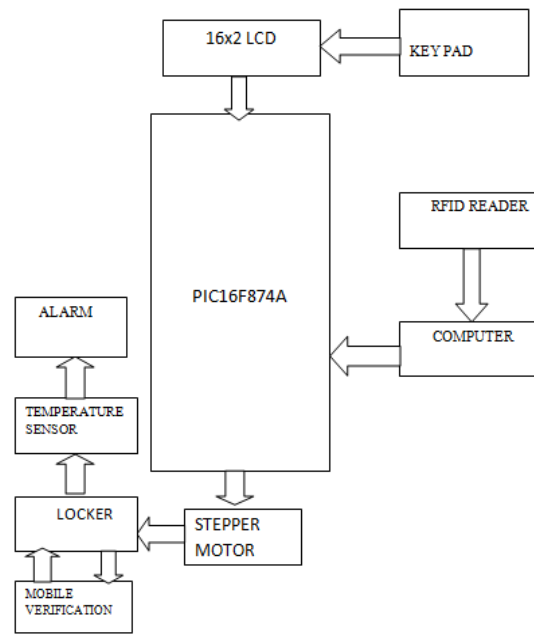

Fig 6Block diagram

If the security proceedings is authorised by the manager the stepper motor bring the appropriate locker to the opening. Then the server will generate the random password. It received in the customer mobile phone as a message with the help of GSM technology. If the password matches the locker will open. To avoid breakages with welding equipments the heat sensor block is provided. If the heat is high enough to melt the metal then the alarm goes on.

XII. CONCLUSION

The implemented project provides a locker system with RFID, password verification, GSM technology. It provides more security facilities. In this the future extension can be made by adding the Digital Image Processing for face recognition. It will ensure high security.

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