International Journal of Advanced Research in Engineering Technology & Science ISSN: 2394-2819

Email: editor@ijarets.org Volume-4, Issue-3 March- 2017 www.ijarets.org

SMART SECURITY SYSTEM FOR MODERN HOME USING RFID

Ankur Chauhan, Sparsh Shukla, Sharad Tiwari, Vaibhav Nirwal
UG Student
Deptt. of Electrical and Electronics Engineering
IMS Engineering College, Ghaziabad

O.P. Yadav
Assistant Professor
Deptt. of Electrical and Electronics Engineering
IMS Engineering College, Ghaziabad

ABSTRACT: RFID is a contactless identification technology based on the transmission of radio frequency waves. Its advantage over the predecessor technologies is that its barcode system increases message and data storage capacity. The typical RFID system consists of three main components, the transponder, reader (detector) and the applications like sms alert.

The RFID reader system constructed in this project was designed to demonstrate access control through the use of low-frequency ID cards. These cards contained identification data that is read by the reader, sent to a database where it is compared to stored values, and implemented depending upon the level of access associated with it. If the card's identification data is in the system, a stored image as well as the name of the user associated with the ID card is displayed. If the data is not in the system, it notifies the user with the message "ACCESS DENIED!" on a display screen. The reader was successfully constructed using Verilog hardware description language in an FPGA. There are various applications of RFID in today's generation like in Smart Currency Detector using RFID is one of the latest application of it, which uses RFID and detects the fake currency and suddenly alert to the source. Some of the other applications which are most commonly useful by the help of RFID are attendance monitoring system, secure files of Defense or Central Government. RFID technique is completely secure and the main reason to use radio frequency is that detects the object without being physically contact in it.

INDEX: RFID, Microcontroller,

I. INTRODUCTION

The RF module as the name suggests, operates at radio frequency [1-4]. The corresponding frequency range varies between 30 KHz & 300GHz. In the RF system the digital data is represented as variations in the amplitude of carrier wave. The kind of modulation is known as Amplitude Shift Keying (ASK).

Transmission through RF is better than IR (infrared) because of many reasons. Firstly signals through RF can travel through larger distance making it suitable for long range applications [5-7]. Also while IR mostly operates in line-of-sight modern signals can travel even when there is an obstruction between transmitter and receiver. Next RF transmission is more strong and reliable than IR transmission. RF communication uses a specific frequency unlike IR signals which are affected by other IR emitting sources.

The RF module comprises of an RF Transmitter and an RF Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency of 434MHz [8-9]. An RF transmitter receives serial data and transmits it wirelessly through RF antenna connected at pin4. The transmission occurs at the rate of 1Kbps-10Kbps. The transmitted data received by an RF receiver operating at the same frequency as that of the transmitter.

II. METHODOLOGY

The project uses AT89S52 Microcontroller, a KA78XX/KA78XXA 3-Terminal 1A positive Voltage Regulator. A 16*2 LED display, the microcontroller is connected to RC circuit to and to provide clock pulse, also a 7805CV voltage regulator is connected in circuit to regulate the voltage [10-11].

The capacitor is also attached to the circuit to provide the pure Dc to the circuit voltage for microcontroller circuit. The Bluetooth model is also connected across it to provide the SMS alert of fake RFID. A buzzer is also connected for alarm to the source at the particular instance, the battery used is dc and is charged by the help of a charger which 220V ac and it is step down to 12V by the help of step down transformer and it

is further rectified to the Dc by the help of Rectifier up to which is also connected to a filter capacitor.

III. DIODES & Voltage Regulator

Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. The KA78XX/KA78XXA series of three-terminal positive regulator are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a wide range of applications. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

FEATURES

- Diffused Junction
- High Current Capability and Low Forward Voltage Drop
- Surge Overload Rating to 30A Peak
- Low Reverse Leakage Current
- Lead Free Finish, RoHS Compliant (Note oscillations at other frequencies outside the band. Another method to isolate a particular radio frequency is by oversampling.
-

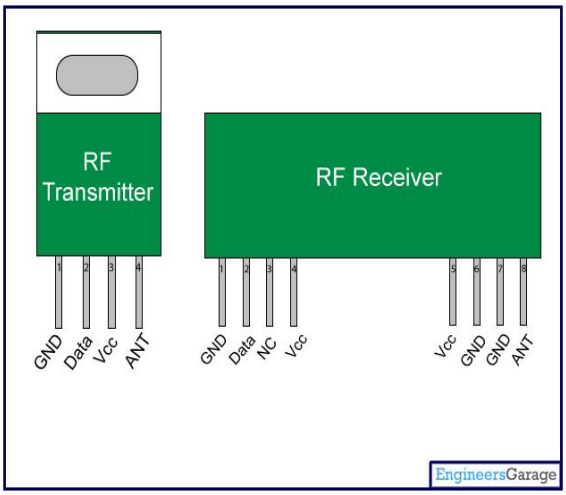
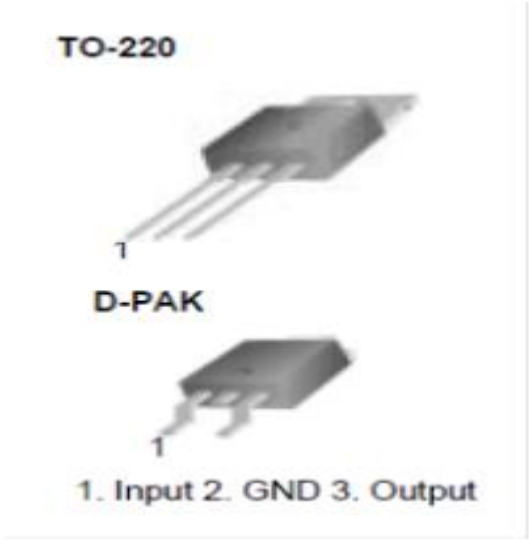


Fig.1. RF Control System



IV. MICROCONTROLLER

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory.

The device is manufactured using Atmel's high-density non-volatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin out.

The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional non-volatile memory programmer.

By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications. The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry.

In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes.

The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning.

The Power-down mode saves the RAM con-tents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset.

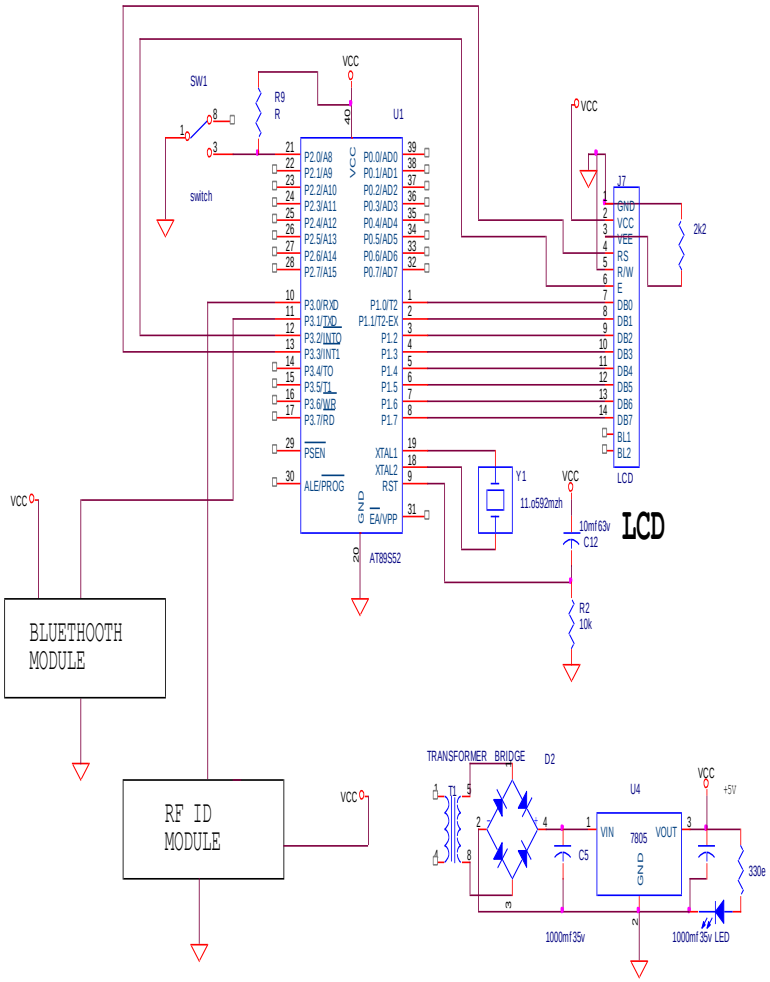


Fig.2. Microcontroller and Circuit Diagram of Complete Circuit

V. CONCLUSION

In this paper, design of a Smart RFID DETECTOR system for use in day today life is presented. The system uses RFID identification with technology to differentiate between valid and FAKE.

The system accomplishes the security and access control task by processing information from sub-controllers.

These controllers include entrance monitoring controller, exit monitoring controller and mess monitoring controller installed at entrance gate, exit gate and mess gate respectively. These controllers read RFID tag issued to the user and search

This tag number in non-volatile RAMS. On a successful match, the controllers request the computer terminal to capture the note.

The system uses neural network trained RFID tag by a particular number recognition module to verify the user authenticity and responds to the controllers by sending them „original" or „fake" message with buzzer. This will also send the text message on the cell phone of the source.

The controllers grant the access to the user or make emergency call accordingly. This system is made centralized with the help of WM reader .It tells the information from RFID checker in circuit and keeps track of a particular currency.

Although the developed system is useful in reducing security threats to the people, there is a room for improvement in the response time of the system.

The response time can be improved by using dedicated processors instead of small systems capable of processing the more power in real time.

VI. FUTURE SCOPE

The practical application domains where robotic technology is most likely to be used are

- Vehicle Parking System.
- Smart Currency Detector.
- Security systems.
- Various types of Goods and Transport services.
- RFID based Passport details.
- Attendance system.
- Device control and authentication.
- Private agencies
- RFID based Banking system.

VII. REFERENCES

1. D. L. Wu, Wing W. Y. NG, D. S. Yeung, and H. L. Ding, "A brief survey on current RFID applications," in Proc. International Conference on Machine Learning and Cybernetics, Baoding, July 12-15, 2009, pp. 2330-2334.
2. B. Yan and D. Y. Lee, "Design of spot ticket management system based on RFID," in Proc. International Conference on Networks Security, Wireless Communications and Trusted Computing, 2009, pp. 496-499.
3. G. Ostojic, S. Stankovski, and M. Lazarevic, "Implementation of RFID technology in parking lot access control system," in Proc. Annual RFID Eurasia Conference, 2007, pp. 1-5.
4. N. Ahmad, S. Butler, and U. Ramachandran, "Guardian Angel: An RFID based indoor guidance and monitoring system," 2010, pp. 546-551.
5. K. S. Huang and S. M. Tang, "RFID applications strategy and deployment in bike renting system," Proc. ICACT 2008, pp. 660-663.
6. S. Lahiri, RFID sourcebook, IBM Press, Westford, Massachusetts, 2006.
7. F. Lourenco and C. Almeida, "RFID based monitoring and access control system," in Proc. INFORUM, 2009.
8. R. Weinstein, "RFID: A technical overview and its application to the enterprise," IT Professional, vol. 7, no. 3, May-June 2005, pp. 27-33.
9. X. L. Meng, Z. W. Song, and X. Y. Li, "RFID-Based security authentication system based on a novel face-recognition structure," in Proc. WASE International Conference on Information Engineering, 2010, pp. 97-100.
10. D. L. Wu, Wing W. Y. NG, Patrick P. K. Chan, H. L. Ding, B. Z. Jing, and D. S. Yeung, "Access control by RFID and face recognition based on neural network," in Proc. International Conference on Machine Learning and Cybernetics, July 11-14, 2010, pp. 675-680.
11. M. A. Mazidi, J. C. Mazidi, and R. D. Mckinaly, the 8051 Microcontroller and Embedded Systems, Pearson Education, 2006.