

Development of an RFID Based Common Access Control System

Gomathi M¹, Kavya S², Manimegalai K³, Subathra B⁴, Aiswarya S⁵

UG Student, Sri Eshwar College of Engineering, Coimbatore^{1, 2, 3, 4}

Assistant Professor, Sri Eshwar College of Engineering, Coimbatore⁵

Abstract: In our proposed system, a magnetic door lock is administered via RFID reader that initiates the authentication as well as validation of the user or controls the access in short. The systems also maintain evidences regarding the access and exit records of each user in the form of a log report against every access. The system is more convenient to install and implement as access security solution of a particular arena due to its cost effectiveness with respect to the satisfactory level of protection provided. Another advantage is that the system consumes considerably less space for installation and maintenance purpose. In this concept for radio frequency identification (RFID) is used to recognize the user identity using like a smart card solution. This may used to know the user details and also the document which we kept in the safety locker. It is same proceeding for replacing the document inside the locker. For every user had specific code only can handle by through the RFID tag. RFID reader is helps to precede using AURDINO Micro Controller. This may used to handle the motor in door to open, when it is a right user. PC is used to store the particulars information about the users of the handling the documents.

Keywords: RFID, AURDINO Micro Controller, Common Access Control System, Auto-ID.

INTRODUCTION

In recent years automatic identification procedures (Auto-ID) have become very popular in many service industries, purchasing and distribution logistics, industry, manufacturing companies and material flow systems. Automatic identification procedures exist to provide information about people, animals, goods and products in transit. The omnipresent barcode labels that triggered a revolution in identification systems some considerable time ago, are being found to be inadequate in an increasing number of cases. Barcodes may be extremely cheap, but their stumbling block is their low storage capacity and the fact that they cannot be reprogrammed.

The technically optimal solution would be the storage of data in a silicon chip.

The most common form of electronic data-carrying device in use in everyday life is the smart card based upon a contact field (telephone smart card, bank cards). However, the mechanical contact used in the smart card is often impraction.

BLOCK DIAGRAM:

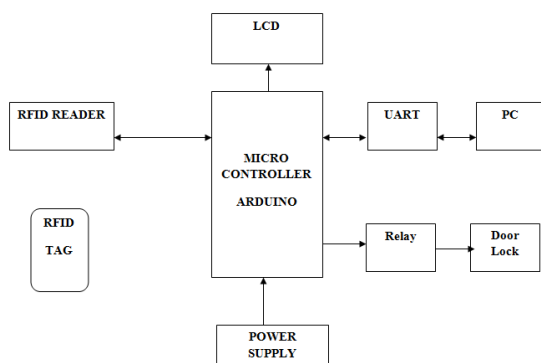


Figure 1: Block Diagram

ARDUINO:

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions.

ARDUINO BOARD:

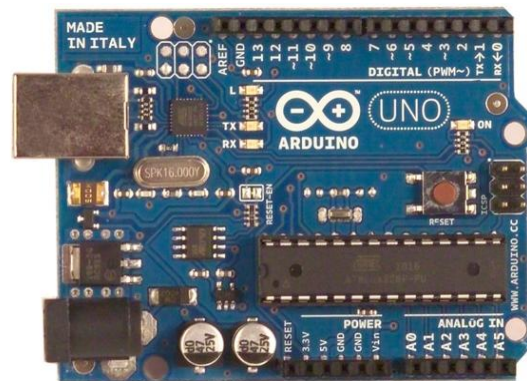


Figure 2: Arduino Board

RFID READER AND TAG:

An RFID reader is a device that is used to interrogate an RFID tag. The reader has an antenna that emits radio waves; the tag responds by sending back its data. An RFID tag is a microchip combined with an antenna in a compact package; the packaging is structured to allow the RFID tag to be attached to an object to be tracked. "RFID" stands for Radio Frequency Identification. The tag's antenna picks up signals from an RFID reader or scanner and then returns the signal, usually with some additional data (like a unique serial number or other customized information). A passive tag is an RFID tag that does not contain a battery; the power is supplied by the reader. When radio waves from the reader are encountered by a passive rfid tag, the coiled antenna within the tag forms a magnetic field. The tag draws power from it, energizing the circuits in the tag. The tag then sends the information encoded in the tag's memory. The RX and TX pins of RFID reader connected to Tx and Rx pins of 8051 Microcontroller respectively. Then the reader senses the data from the Tag and transmits the sensed data to microcontroller via serial port.



Figure 3: RFID Reader And Tag

LCD DISPLAY

Liquid crystal cell displays (LCDs) are used in similar applications where LEDs are used. These applications are display of display of numeric and alphanumeric characters in dot matrix and segmental displays.

POWER SUPPLY

Power supply is a reference to a source of electrical power supply. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others. Power supplies for electronic devices can be broadly divided into linear and switching power supplies. The linear supply is a relatively simple design that becomes increasingly bulky and heavy for high current devices; voltage regulation in a linear supply can result in low efficiency. A switched-mode supply of the same rating as a linear supply will be smaller, is usually more efficient, but will be more complex.

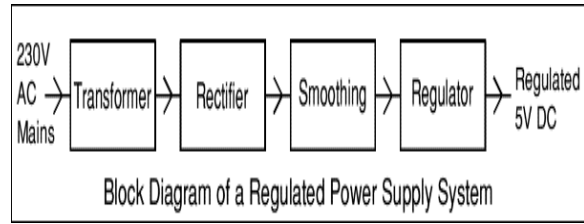


Figure 4: Power Supply

UART:

A universal asynchronous receiver/transmitter abbreviated UART is a computer hardware device that translates data between parallel and serial forms. UARTs are commonly used in conjunction with communication standards such as TIA. The universal designation indicates that the data format and transmission speeds are configurable.

PERSONAL COMPUTER:

The number of users who viewed the document will be displayed in the monitor.

DC MOTOR

A DC motor in simple words is a device that converts direct current (electrical energy) into mechanical energy. It's of vital importance for the industry today, and is equally important for engineers to look into the **working principle of DC motor** in details that has been discussed in this article. In order to understand the **operating principle of dc motor** we need to first look into its constructional feature.

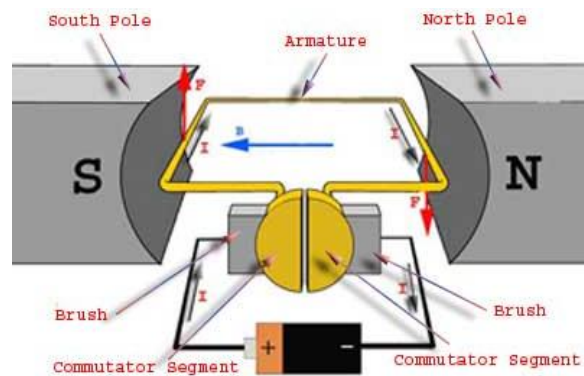


Figure 5: Dc Motor

CIRCUIT DIAGRAM

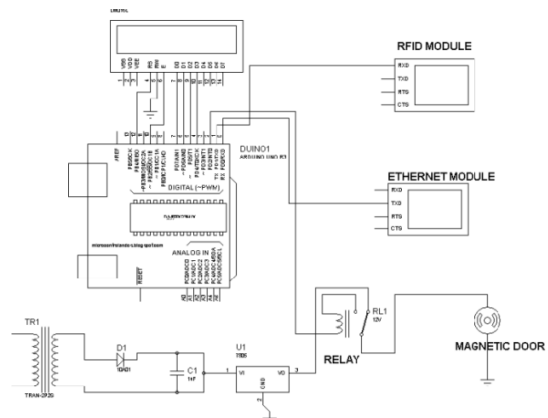


Figure 6: Circuit Diagram

CIRCUIT DIAGRAM EXPLANATION

They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA an internal pull-up resistor (disconnected by default) of 20-50 k Ohms. In addition, some pins have specialized functions:

Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data.

External Interrupts: 2 and 3. These pins can be configured to trigger an interrupt on a low value, arising or falling edge, or a change in value.

PWM: 3, 5, 6, 9, 10, and 11. Provide 8-bit PWM output with the analog Write () function.

SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication, which although provided by the underlying hardware, is not currently included in the Arduino language.

LED: 13 There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

I2C: 4 (SDA) and 5 (SCL). Support I2C (TWI) communication using the Wire library.

AREF. Reference voltage for the analog inputs. Used with analog Reference().

Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

HARDWARE IMPLEMENTATION:



Figure 7: Hardware Implementation

CONCLUSION

The main purpose of the project is to manage the documents in any organization .If you want to find out any documents means we can detect it by RFID reader and tag. If they lost any documents means it will be identified by previous usage of the user.

This concept can be extended by improving eye recognition and finger print method. This project can

also be implemented in future by comprising ATM system and bank locker.

REFERENCES

1. E. Ngai and F. Riggins, RFID: Technology, applications, and impact on business operations, International Journal of Production Economics, vol. 112, no. 2, pp. 507-509, Elsevier, 2008.
2. G. K. Verma and P. Tripathi, A Digital Security System with Door Lock System using RFID Technology, International Journal of Computer Applications (IJCA), vol. 5, no. 11, pp. 6-8, August 2010.
3. K. S. Ravi, G. H. Varun, T. Vamsi and P. Pratyusha, RFID Based Security System, International Journal of Innovative and Exploring Engineering (IJITEE), vol. 2, no. 5, pp. 132-134, April 2013
4. Taesung Kim, Howon Kim, "Access Control for Middleware in RFID Systems", International Conference on Advanced Communication Technology (ICACT'06)
5. Woochul Shin, Xun Li, Sang Bong Yoo, "Access Control of RFID Middleware Using Extended Usage Control Model," 2008 IEEE.