

ARDUINO BASED MAIL NOTIFIER SYSTEM

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RESEARCH AREA : IOT

ABSTRACT

Physical Mail or Post is a method of transporting documents, packages, cards, parcels and letters. This service is usually done by a postal service system. Mail is usually delivered by mail man post man to our homes. We get important documents like bills, invitations, bank statements etc. in mail. If we don't check our mail box regularly, we might miss the deadlines for payment of bills etc. It is a tedious job to regularly check for mail as mail boxes are often placed outside the house or in some cases, a common place at the end of the street. In this project, a simple mail alert system is developed using simple and cheap wireless communication devices. The aim of the project is to notify the user with a message whenever he/she receives a mail in their mailbox.

The main sensor used for detecting the mail is the photo resistor or LDR. Majority of mailboxes are open and shut type i.e. a small door must be opened and the mail must be placed inside the box. If we place the LDR on the inside of that small door, it receives light only when the door is opened to insert a mail. As the LDR senses the changes in the ambient lighting (by changing its resistance accordingly), it can differentiate between a door – open scenario and a door – close scenario.

Keywords: Mail notification, arduino, message, LDR, Sensor

INTRODUCTION

Also throughout the years, the technologies have received a massive spec bump thus supporting a better hardware and software. Our project is thus a arduino based mail notification system which is made available to all the common people of our society. Following are the features that our system aims to offer: -

Our system will be installed outside the homes in the post letter box. As soon as the mail is inserted inside the box the owner will receive a mail as "MAIL MAIL MAIL MAIL MAIL"

Our system will also be verified by our head Prof. JayaKumar Sir and other faculty incharges in order to assure authenticity. Hence, in this project, a simple but efficient mail notifier system is designed using Arduino and few other components. This system notifies the user whenever there is a mail and hence avoiding the need to check for mail frequently. The project is based on Arduino, RF Module (RF Transmitter and Receiver) and a light sensor (Photo resistor or LDR).

The existing system is actually android based student notification system. The main objective of the proposed system is to make the interaction between the user and the system which is easier and less complicated. The main reason behind having this idea is to help common people who are usually dealing with problems such as missing the deadline of electricity bill and many important documents which comes through the physical mail.

IDENTIFICATION OF NEED

“Arduino based mail notifier system” is very convenient to implement and quite easy to understand. The most important thing is that it can be implemented by users in their daily life. The need of designing such a system is to act as a helper for the people who sometimes miss the important mails or the deadlines.

FEASIBILITY STUDY: -

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of the existing system or proposed venture. In its simplest term, the two criteria to judge feasibility are cost required and value to be attained. As such, a well-designed feasibility study should provide historical background of the project. Generally, feasibility studies precede technical development and project implementation. The assessment of feasibility study is based on the following factors:

- 1) Technical Feasibility
- 2) Operational Feasibility

TECHNICAL FEASIBILITY

Generally, feasibility studies precede technical development and project implementation. The assessment is based on a system requirement in terms of Input, Processes, Output, Fields, Programs, and Procedure. This can be quantified in terms of volumes of data, trends, frequency of updating, etc., in order to estimate whether the new system will perform adequately or not. Technological feasibility is carried out to determine the capability, in terms of software, hardware, personnel and expertise, to handle the completion of the project.

OPERATIONAL FEASIBILITY

Operational feasibility is a measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. The operational feasibility of the system can be checked as it solves the problems and reduces the complications occurring in the paper-pencil test.

CONCLUSION OF FEASIBILITY STUDY: -

1) Technical Feasibility:

The system can be implemented using computer software & hardware.

2) Operational Feasibility:

The system efficiently operates & reduces manual computation and time of processing, reducing cost of paperwork and human errors.

THEORY

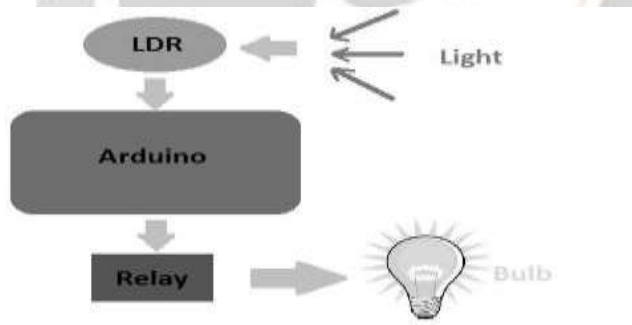
This System is basically the destination from where the user can easily know about the mails and the documents which they are receiving in their post box outside their houses. Detailed features of this system will contain or allow the following things: -

PROFILE: -

USER: The user will be the person who is installing this system inside their letterbox.

ADMINISTRATOR: The admin will be the provider of the system who will look after the overall configuration and the programming part.

SYSTEM ARCHITECTURE DIAGRAM



MODULES

The current project of mail notifier system is developed using arduino and LDR. Arduino is single-board microcontrollers and microcontroller kits for building digital devices and interactive objects. Since Arduino is a single-board microcontroller it is specifically used for repetitive task .Arduino comes as a great ally for doing electronics projects as it does not require OS or software application to run, all it needs is few lines of codes.LDR is photo-register, It is a component that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light sensing circuits. There are few modules of this system.

- Power Supply
- Sensor module
- Connection Module
- Microcontroller module(Arduino)

- Algorithm module
- Lighting module
- LDR
- Resistors

The Following are components involved:

Transmitter Part

- Arduino UNO (or any Arduino compatible board)
- 434 MHz (or 315 MHz) RF Transmitter Module
- Photo Resistor (Light Dependent Resistor – LDR)
- 15 K Ω Resistor (or 10 K Ω Resistor)
- Battery
- Bread board (Prototyping board)
- Connecting wires

Receiver Part

- Arduino UNO (or any other Arduino compatible board)
- 434 MHz (or 315 MHz) RF Receiver Module
- Power supply

CIRCUIT COMPONENTS:

1: LDR

LDR or light dependent resistor as the name imply it depends upon the light completly. When voltage as input is given to the LDR and no light is falling on it the the LDR will not produce the output. But as the voltage is provided and the light is falling on the LDR the output will be generated. The intensity of light falling on the LDR in this project must be more than the thrashhold value given before only then will the LRD produce output.

2) ARDUINO UNO

Arduino is an open source microcontroller along with AT-mega328. It is the backbone or we can call it as the brain of this project. It consists of about 14 input/output pins and 6 analog pins. All the connection to the Arduino is made with the help of these pins. As the Arduino receives the input signal it works on it and produces the output. The code has to be written on the computer itself and should be compiled in its software and when compiled completely it should be uploaded to the Arduino with the help of a cable.

3) LEDS

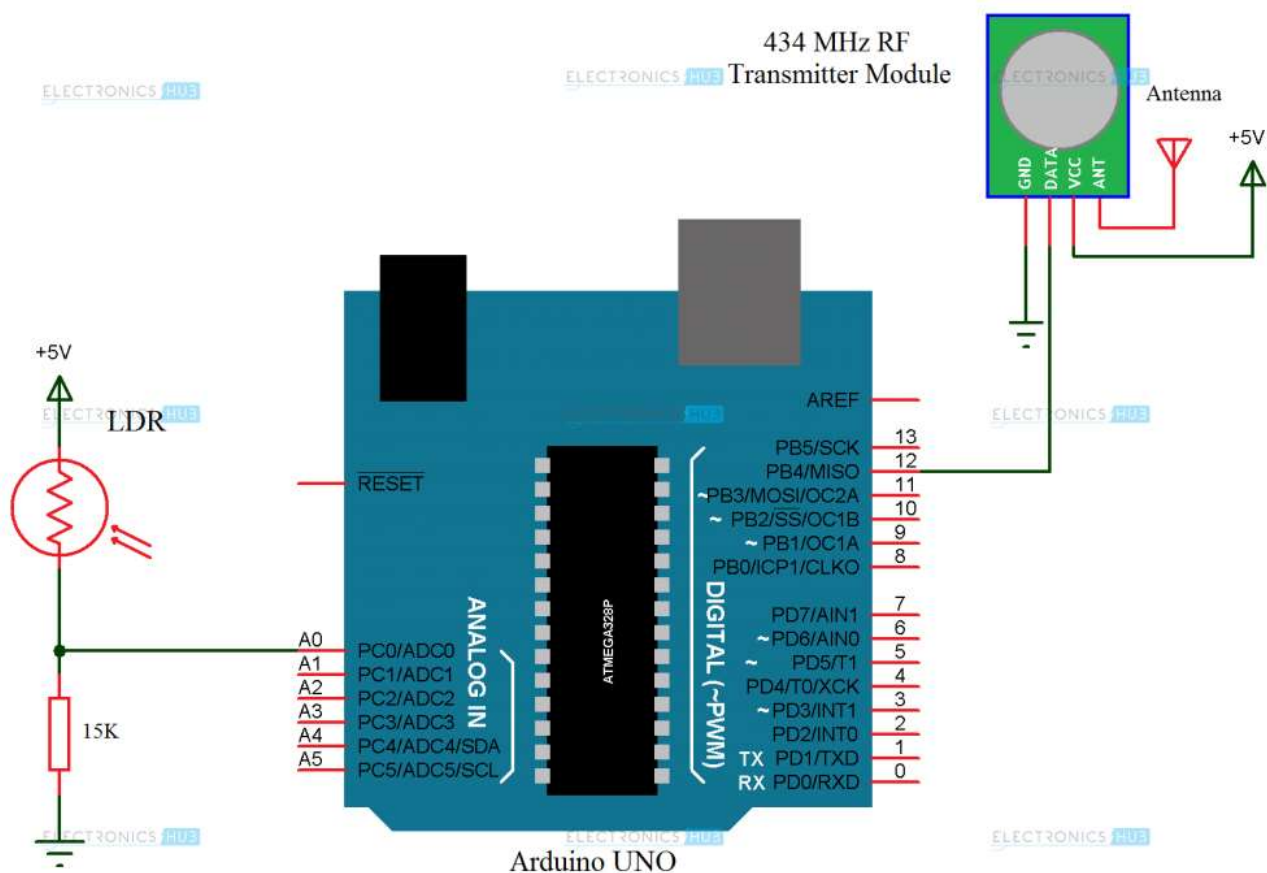
LED stands for light emitting diode. It is based on the PN junction theory made up of semiconductors along with semiconductors an edge emitting LED also requires substrate in its construction. As the voltage is passed across the LED it will emit light as the output due to the movement of electrons and photons in the PN junction.

4) RF Transmitter and Receiver Module:

The 434 MHz RF Transmitter – Receiver pair is a cheap way to implement wireless communication. It can be used in wireless data transmission for different applications like RC cars, wireless doorbells, home automation etc.

Transmitter Part

The transmitter part of the project consists of Arduino UNO, 434 MHz RF Transmitter Module and a photo resistor. The transmitter module used in the project consists of 4 pins. VCC is connected to 5V supply and GND is connected to ground terminal. These two terminals can be connected to the respective pins of the Arduino. The data pin receives data from the Arduino UNO. So, it is connected to pin 12 of the Arduino UNO. Some RF Transmitter modules come with antenna attached to the board. For smaller distances, the antenna is really not necessary. But for larger distances i.e. over 10 meters, then we need to connect a 15 CM antenna (a simple wire will suffice). Coming to the sensor part of the project, the LDR must be connected to the Analog IN pins of the Arduino. In order to convert the change of resistance to something which Arduino can easily understand, the LDR and an additional resistor (10 K Ω or 15 K Ω) are connected in a potential divider fashion (as LDR is basically a variable resistor) and the output of this potential divider is connected to the Analog Input A0 of the Arduino.



Receiver Part

The receiver part of the project consists of Arduino UNO board and the 434 MHz RF Receiver Module. As the aim of the project is to simply transmit the message on the event of reception of mail, no other components are used in the receiver section. The receiver module has 4 pins on it. The VCC pin must be connected to 3.3V pin of the Arduino just to be safe (although the receiver module can tolerate 5V). The GND is connected to ground pin of the Arduino. Arduino UNO receives data from the RF Receiver. Hence, the data out pin of the RF Receiver is connected to pin 11 of the Arduino. As mentioned in the transmitter part, a simple 15 CM long wire will act as the antenna.

APPLICATIONS AND FUTURE SCOPE

- As it is a simple mail notifier system, only messages are transmitted. For better notification, we can implement a buzzer system.
- The project can be further expanded by implementing a GSM Module which sends the user a message on his/her phone whenever a mail has been detected.

ACKNOWLEDGEMENT: -

We respect and thank our Assistant Prof. Ms.Brinda mam, for providing us an opportunity to do the project work at SRM University Ramapuram, Chennai and giving us all the support and guidance which made us complete the project duly. We are extremely thankful to her for providing guidance from time to time.

CONCLUSION:

This Arduino based undertaking will give a boon to technology in the industry and will aid to common people in the society by the services. With a capacity to help common people by making a system and without any manual work they will receive the notification. In the wake of arranging the circuit which gives the notification on the screen as depicted is no uncertainty an innovation with numerous future application separated from the way that it can likewise be utilized as a part of numerous present day tech. The use of this brilliant notifier will without a doubt change the world that we are seeing today.



REFERENCES: -

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BIOGRAPHIES

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