

“AUTOMATIC CARGO PLANT”

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ABSTRACT: Radio Frequency Identification (RFID) technology has the potential to dramatically improve numerous industrial practices. However, it still faces many challenges, including security and reliability, which may limit its use in many application scenarios. While security has received considerable attention, reliability has escaped much of the research scrutiny. In this work, we investigate the reliability challenges in RFID-based tracking applications, where objects (e.g., pallets, packages, and people) tagged with low-cost passive RFID tags pass by the RFID reader's. Combining with the radio frequency identification (RFID) technology for tracking and trace technology provides an effective solution on the basis of using RFID and ATMEGA 16. Automatic identification and event handling, sharing of items, "transparent" management. RFID based Real Time Location Tracking System (RTLS) for tracking transit goods is discussed. This paper discusses the design and implementation of RTLS for tracking wet cargo, and points out the strengths, benefits, weaknesses and limitations of the solution. The effectiveness of the solution was demonstrated in addressing the weaknesses of the current manual tracking system in curbing diversion for wet cargo. In addition, the use of RTLS led to a reduction in turnaround times by between thirty to forty percent compared to those which are manually tracked.

Keywords: RFID reader, ATMEGA-16, Monitoring parameters, RTLS, Scrutiny

1. INTRODUCTION

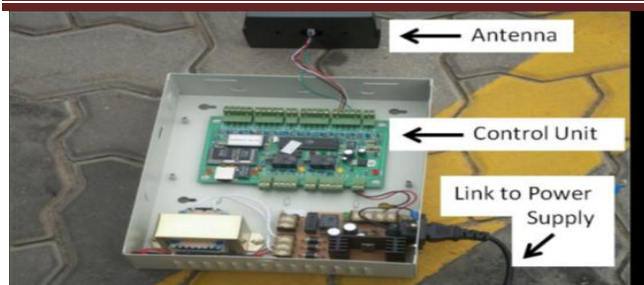
Cargo plant is one of the busiest plants. There are lots of Packages, Travelers luggage, other parcels are received per hour per day and it is very difficult to staff members to carry them all from the flits to the airport and then to the passengers. So for helping such people and reducing their work we are here with the concept of Automatic Cargo Plant. we use automatic cargo plant for the product tracking and traces of technology including the label of the product, as well as information transmission and information management, etc. Through the tracking and tracing, system can determine the source of the raw material or component, products processing and history, in the process of circulation and delivery location. As for the user, in time and space with the qualitative and quantitative within the scope of the way to track the product [1].

Recent years are featured with reports of important and interesting results in utilization of RFID technology in supply chain management. This paper is focused on applying RFID for passenger and cargo control. The results showed high accuracy (99%) of the completely automatic system[2].

The purposes of this paper is to integrate supply chain partners own information exchange network platform and establish cargo tracking system to provide information related with status of goods and goods tracking[3]

2. RFID READER

RFID is a radio frequency identification system. This is an ADC technology. The RFID systems are fast, reliable, and do not require physical contact between transmitter and receiver. RFID is an automatic identification method wherein the data stored on RFID tags or transponders is remotely retrieved. It is a wireless use of electromagnetic field to transfer data, for the purpose of automatically identifying and tracking tags attached to objects.



3. THE ATMEGA16 MICROCONTROLLER

The AT mega16 microcontroller used in this lab is a 40-pin wide DIP (Dual Inline) package chip. This chip was selected because it is robust, and the DIP package interfaces with prototyping supplies like solder less bread boards and solder-type boards. This same microcontroller is available in a surface mount package, about the size of a dime. Surface mount devices are more useful for circuit boards built for mass Production.

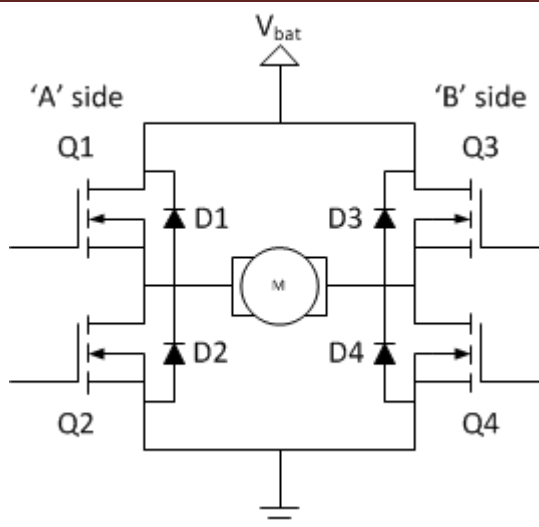


4. LCD (Liquid Crystal Display)

The display used is 16x2 LCD (Liquid Crystal Display); which means 16 characters per line by 2 line. The standard is referred as HD44780U, which refers to the controller chip which receives data from an external source (Here Atmega16) and communicates directly with the LCD. Here 8-bit mode of LCD is used, i.e., using 8-bit data bus. The three control lines are **EN**, **RS**, and **RW**. For sending data to the LCD, the program should make sure that the line is low (0) and then set the other two control lines or put data on the data bus.

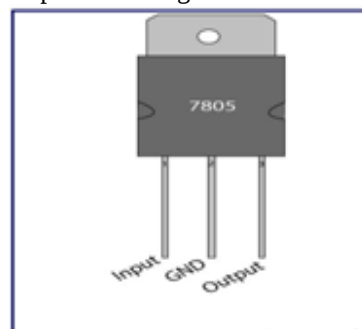
5. H-BRIDGE

A H-bridge is an electronic circuit that enables a voltage to be applied across a load in either. This circuit are also used in robotics and other application direction to allowed DC motor to run forward and backward.



6. VOLTAGE REGULATOR (7805)

7805 is a voltage regulator integrated circuit. It is a member of 78xx series of fixed linear voltage regulator ICs. The voltage source in a circuit may have fluctuations and would not give the fixed voltage output .The voltage regulator IC maintain the output voltage at a constant value. The xx in 78xx indicates the fixed output voltage it is designed to provide.7805 provides +5V regulated power supply .Capacitors of suitable values can be connected at input and output pins depending upon the respective voltage levels.



7. POWER SUPPLY

Power supply is the circuit from which we get a desired dc voltage to run the other circuits. The voltage we get from the main line is 230V AC but the other components of our circuit require 5V DC. Hence a step-down transformer is used to get 12V AC which is later converted to 12V DC using a rectifier. The output of rectifier still contains some ripples even though it is a DC signal due to which it is called as Pulsating DC. To remove the ripples and obtain smoothed DC power filter circuits are used. Here a capacitor is used. The 12V DC is rated down to 5V using a positive voltage regulator chip 7805. Thus a fixed DC voltage of 5V is obtained.

8. IR SENSOR

An infrared sensor is an electronic instrument which is used to sense certain characteristics of its surroundings by either emitting and/or detecting infrared radiation. These are also capable of measuring the heat being emitted by an object and detecting motion.



9. RF MODULE CC2500

The CC2500 is a low cost 2.4GHz transceiver designed for very low-power wireless applications. The circuit is intended for the 2400-2483.5MHz ISM(Industrial Scientific and Medical) and SRD (Short Range Device) frequency band. The RF transceiver is integrated with highly configurable modem.

10. SOFTWARE REQUIREMENT

A. Atmel Studio: Release 6.0

Atmel Studio is the new integrated development environment from Atmel. It provides us a modern and powerful environment for doing AVR and ARM development. Get started by exploring the included example projects. Run your solution on a starter or evaluation kit. Program and debug our project with the included simulator, or use one of the powerful on-chip debugging and programming tools from Atmel. Get productive with the various navigate, refactor and intelligence features in the included editor. Experience seamless integration with various Atmel WEB services like Atmel Video Lounge, Atmel Store and datasheets to keep you updated and help you to design your solutions. With strong extension possibilities and online gallery, it is possible for both designers and 3rd party to provide plug-ins and customize the environment for best use and productivity.

Atmel Studio carries and integrates the GCC tool chain for both AVR and ARM, Atmel Software framework, AVR assembler and simulator.

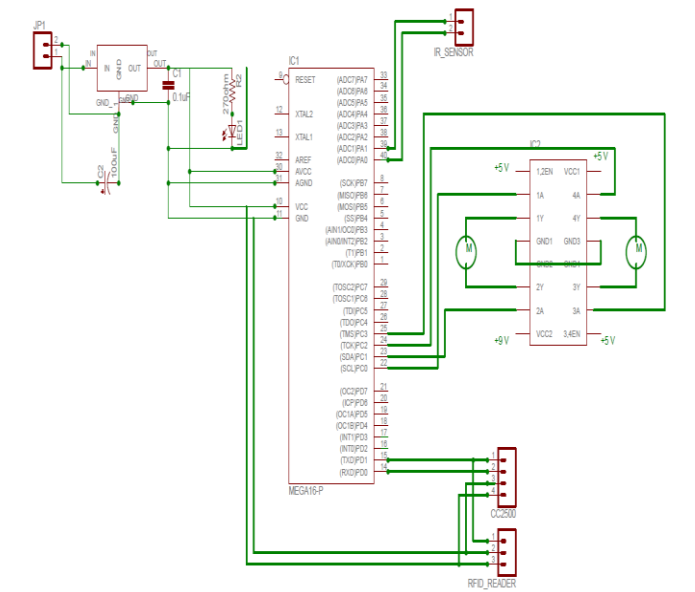
B. PCB Artist

PCB Artist is just one of many PCB layout software tools available to use, but an understanding of one layout tool can easily transfer to any PCB design tool. PCB Artist is a free software tools.

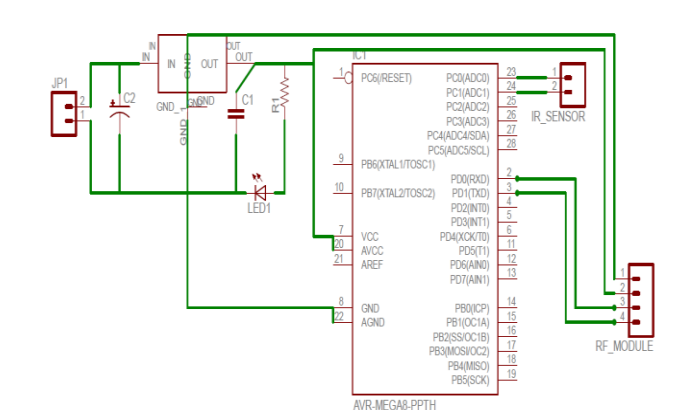
The process for PCB design is to first create a list of parts you will use in the circuit, then search for these parts in the libraries available. If the parts are not in any of the available libraries, we must create the components. This includes making a schematic symbol, a PCB symbol and then creating a component that will connect the two together in order for the program to relate the schematic to the PCB design. Next create the schematic, which is a symbolic representation of the circuit, configuring the functionality of the circuit. The final step is to then tell the software to import all the components' PCB symbols that are in the schematic and arrange them physically how we want them to be fabricated on the board. After ordering the completed PCB we must then order the parts to populate the board. The parts can be professionally soldered, or we can solder the parts our self.

11. CIRCUIT DIAGRAM

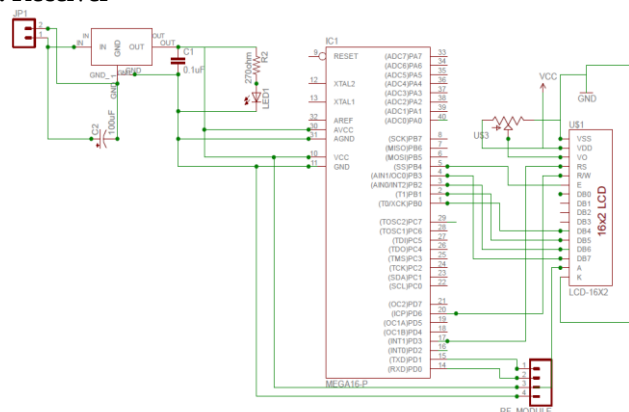
A. Goods carrier



B. Transmitter



C. Receiver



12. CONCLUSION

The system showed higher performance than conventional systems and easily extendible. The system extension only needs adding one RFID Reader to the system. The simulated model tested exponential, Poisson, etc. functions and finally uniform model generated the best results. Moreover, higher performance is achievable by more power and coverage of downlink and uplink and higher quality frequency. In general, in comparison with conventional system, RFID technology can be used with minimum expenditure and workforce demand to implement an intelligent and highly reliable system.

This plant 99% reliable and only 1% chance occur that to repeat this process.

13. REFERENCE

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[2]In November 2012, Abolfazl Rajabi, Mostafa Tavassoli, Sasan Mohammadi, Mehrdad Javadi,"RFID for Cargo and Passenger Automation and Control in Airline Industry"International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-2, Issue-5

[3]In May 2013,Chao-Chen Hsieh and Jun-Zhi Chiu, "Establish Exchange Network Platform and Cargo Tracking system"

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