

RFID Based Smart Trolley System

Jyothsna .T¹, Y Mahesh², L Ramamurthy³

¹M.Tech Student, Department Of Embedded System Vemu Institute of Technology, Andhra Pradesh, India

²Guide, Vemu Institute Of Technology, Department of Electronics And Communication Engineering, Andhra Pradesh, India

³Hod, Department of ECE, Vemu Institute of Technology, Andhra Pradesh, India

ABSTRACT

We are designing a project called RFID based smart trolley system in which we are using RFID and ZIGBEE technology. This system is implemented to eliminate the drawbacks of barcode scanning based billing system. In old system people suffer from time wastage by standing in the long queues.

I. INTRODUCTION

In the proposed system we are attaching RFID reader to every trolley. When a product is placed in a trolley it reads 12 digit ID number from RFID tag .After that it sends data to the central billing system w.r.t. to code implemented on the IDE.

Existing System:

In the Existing system the barcode scanner is used to scan barcode of each and every product by the seller at one place. The customers wait in a long queue for billing of the products

Disadvantages:

- ✓ Time wastage
- ✓ Hard to place the Product in exactly in between Sensors to identify.
- ✓ Difficult to identify the Product.

Proposed System:

In the Proposed System we have implemented the system efficiently to transfer the Data Successfully to the Billing Session. In this System we are using RFID Reader and Zig-Bee to Data Transferring.

II. BLOCK DIAGRAM

Transmitter circuit:

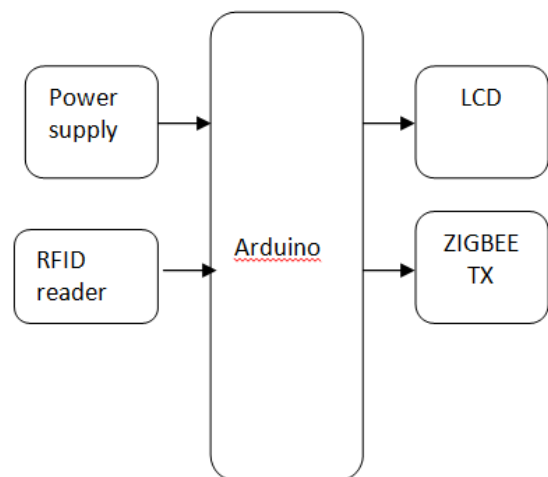


Figure 1

Hardware requirement:

Arduino:

The Arduino Micro Controller is a open source platform which has on chip controller with power supply jack, serial port, crystal oscillator with frequency 16 MHZ.

It has 6 analog pins,14 digital pins and some supply pins. They are different boards like Arduino Nano, Arduino Uno, Arduino mega etc..,



Figure 2

ATMEGA328P FEATURES:

- Elite constancy, Low Power use with 8-Bit Microcontroller.
- Advanced Reduced Instruction Set Computer (RISC) Architecture which has the going with parts as takes after
- ✓ It has 131 Strong Instructions.
- ✓ Most executable instruction is single clock cycle.
- ✓ It escort totally static operation
- ✓ It has senior non-whimsical Memory Segments
- ✓ It has 32 KB In-scheme self-designed Flash memory
- ✓ It has 1KB EEPROM
- ✓ It has 2KB Intramural static RAM
- ✓ facultative boot code territory with self-deciding jolt bits which has both In-System planned by on-chip boot loader program and absolute read while create operation
- The program can bolted with the help of the item security.
- A segment of the periphery components are according to the accompanying
- ✓ There are two 8-bit clocks counters with free re-scale and consider mode
- ✓ There are two 8-bit clocks/counters with independent re-scale and think about mode
- ✓ It has consistent counter with detached oscillator work
- ✓ It has six pulse width modulation channels
- ✓ It has 10-bit analog to digital converter in TQFP and QFN
- ✓ An arrangement of 10-bit ADC in Plastic DIP
- ✓ A USART for serial communication
- ✓ There are two-master slave SPI linkup's

- Special features of the microcontroller are detailed:
- ✓ It was reset when power on.
- ✓ It has on chip internal Oscillator
- ✓ An extra 6 sleep modes are available, stand-by mode is also available
- ✓ It has 28 Input and Output lines in plastic DIP
- ✓ It was operate in 1.8 - 5.5 Volts

POWER SUPPLY:

It is a circuit which converts AC to DC. It is very essential circuit required for any electronic gadget like mobile, laptop, etc.,

Some Basic components used in Power Supply:

Transformers

Transformer is an electrical component which transfers electrical energy from one circuit to another circuit by changing its voltage strength.

Here we are using step down transformer for reducing 230 V to 12 v.

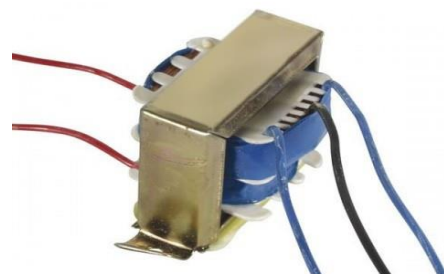


Figure 3

Basically, there are two sides in a transformer one is primary coil and other one is secondary coil.

Rectifier:

Rectifier is an electronic component which converts AC to pulsating DC.

Here we are using four diodes as a bridge rectifier which has high efficiency.

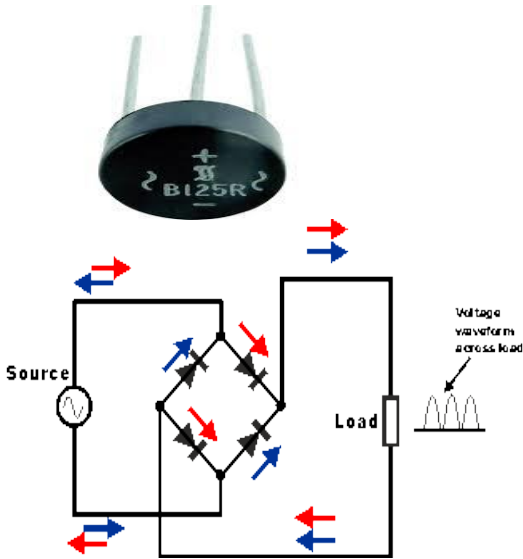


Figure 4

It doesn't change voltage strength.

Capacitors:

Capacitors are used to convert pulsating DC to smooth pure DC. It filters small AC components.



Figure 5

Voltage regulators:

Voltage regulator is used to regulate constant voltage. Here we are using 7805IC This can output 5 V DC.

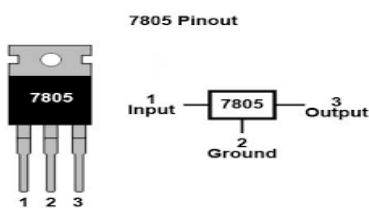


Figure 6

LCD:

LCD (Liquid Crystal Display) screen is a digital display module and discover a vast hodgepodge of employments. A 16x2 LCD show is fantastically basic module and is commonly used as a piece of numerous gadgets and circuits. These modules are supported more than seven elements and different multi segment LEDs.

The fee enlist shops the summon directions given to the LCD. A summon is a heading given to LCD to do a predefined undertaking like presenting it, clearing its show, setting the cursor work, controlling exhibit the cetera. The measurements enroll shops the insights to be appeared on the LCD. The facts are the ASCII estimation of the character to be proven at the LCD. Snap to soak up more about inner structure of a LCD. There are numerous styles of LCD's like 16x2 and 20x4. Here on this challenge we use 16x2 LCD. Here we use dot matrix LCD.

Pin Diagram:

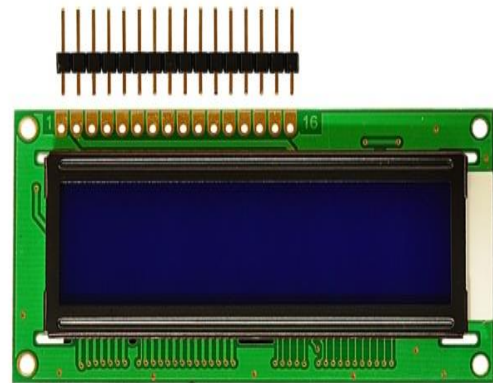


Figure 7

RFID:

Radio Frequency for Identification (RFID) which is used for authentication of any object or a person. This module consists of RFID reader and tags. Each and every tag has unique 12 digit ID number. RFID reader is used to read 12 digit number.



Figure 8

ZIGBEE MODULE

ZigBee Module is a wireless communication module which is cost effective. Its main function is to act as both transmitter and receiver. It is used in limited area application only.

Software Description:

Arduino IDE:

The Arduino IDE is a open source programming platform where we can found collection of examples for different modules. It used to interface different new modules with predefined functions easily.

III. WORKING OF THE PROJECT

In this project, we use following components are arduino, RFID reader and tags, zigbee. RFID reader is used to read ID number and display the cost details of the product on the LCD. By using zigbee modules the data is transferred to Personal computer. After completing shopping, it displays total cost .

APPLICATIONS:

- Easy shopping
- Super markets
- Industries

ADVANTAGES:

- Easy Handling
- Smart Usage
- No Waiting

IV. CONCLUSION

In this project, we have developed a system for shopping by using RFID and zigbee technology

V. REFERENCES

- [1]. Dr.Suryaprasad J, Praveen Kumar B O, Roopa D & Arjun A K "A Novel Low-Cost Intelligent Shopping Cart", 2014 IEEE.
- [2]. Amine Karmouche, Yassine Salih-Alj, "Aisle-level Scanning for Pervasive RFID-based Shopping Applications", 2013 IEEE.
- [3]. Martin Mayer, Nobert Gortz and Jelena Kaitovic, "RFID Tag Acquisition via Compressed Sensing", 2014 IEEE.
- [4]. Satish Kamble, Sachin Meshram, Rahul Thokal & Roshan Gakre, "Developing a Multitasking Shopping Trolley based on RFID Technology", January 2014 International Journal of Soft Computing and Engineering (IJSCE).
- [5]. Mr.P.Chandrasekar, Ms.T.Sangeetha, "Smart Shopping Cart with Automatic Central Billing System through RFID and ZigBee", 2014 IEEE
- [6]. Zeeshan Ali, Reena Sonkusare, "RFID Based Smart Shopping and Billing", International Journal of Advanced Research in Computer and Communication Engineering Vol.2, Issue 12, December 2013.
- [7]. D.Hahnel, W.Burgard, D.Fox K.Fishkin and M.Philipose, "Mapping and localization with RFID technology", Proc.IEEE Int.Conf Robot.Autom, pp.1015 -1020 2004.
- [8]. H.H.Bi and D.K.Lin, "RFID-enabled discovery of supply networks", IEEE Trans.Eng.Manag., vol.56, no.1, pp.129 -141 2009.
- [9]. Y.J.Zuo, "Survivable RFID systems: Issues, challenges, and techniques", IEEE Trans.Syst., Man, Cybern.C, Appl.Rev., vol.40, no.4, pp.406 -418 2010.
- [10]. S.S.Saad and Z.S.Nakad, "A standalone RFID indoor positioning system using passive tags", IEEE Trans.Ind.Electron., vol.58, no.5, pp.1961 -1970 2011.