ZIGBEE BASED FOOD ORDERING SYSTEM FOR SMART RESTAURANT

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ABSTRACT

The project is proposed with the Zigbee technology as the communication medium which implements faster ordering system. The technology able to solve lack number of worker, reduces the error on ordering foods by the customers. The e-menu food ordering system is based on software-hardware platform of Raspberry pi pico and using Zigbee short range radio communication technologies. We have divided the system in two sections one is handheld section (customer section) and other is main section (owner section), both section consists of Zigbee transceivers. At handheld section LCD with touch screen is provided to place the order and order sends further to main section via Zigbee transceiver. Simultaneously buzzer will indicate that order has arrived and LCD display which is at main section is used to display food menu order and cost.

Keywords: Based Food Ordering, Smart Restaurant, Raspberry Pi.

1. INTRODUCTION

Today's method of menu ordering system includes more human efforts for getting an order from the customer, by giving the customer a menu card on their table and also billing is a special attention need to pay for every table and their orders. Hence, the menu ordering through an electronic system interface will get an ultimate response from the users due to the time saving methodology and smarter way to communicate. The wireless communication interface will provide a faster and accurate data transmission in a low cost. The main aim to implement this e-menu ordering system is its user friendly interface as well as to reduce human efforts. The implementation of electronic menu ordering systems may have some differences in interface design and methodology. The zig-bee communication is used as wireless interface and the graphical LCD display with touch screen is used as customer interface. In the recent past there has been evolution in ordering and serving system but still the results are not very much promising. With the advancement in communication technology the issues of being late entertained can be solved. In order to effectively run a restaurant, time saving and cost optimizations are essential. Reduction in time by a few seconds for each table can speed up order processing, increase efficiency and boost profits

Wireless sensor networks have a strong impact all over the world over the wired networks due to the development of new standards and technologies from the last decades. Wireless sensor networks are used in a wide range of applications including remote Monitoring, health care, industrial automation or environmental monitoring. Each WSN may have specific objectives and application goals. Here our objective is to assure maximum quality and minimum spoilage of the stored food in food industry, by maintaining and monitoring of the temperature and humidity of the environment. Sensory data comes from temperature and humidity sensors of different locations, where food is stored and received at the receiver. WSN is formulated by a group of

sensor nodes equipped with short-range communication capability. Every sensor node consists of at least a transceiver, a processing unit, a transducer and a power unit. New standards and technologies like Bluetooth (IEEE 802.15.1), Zigbee (IEEE 802.15.4), having a specific parameter of low power consumption, are used for short range wireless communications. This paper provides the implementation of monitoring and controlling of temperature and humidity in the food industry using Zigbee & Bluetooth modules and to check the performance of the network using both modules. A new design scheme of hotel menu card and ordering system applied to all range hotels is proposed in this paper. Automation systems are increasing in day to day life. Applications like home and industrial automation reduce man power while increasing the efficiency. The Main Goal here is, in restaurant menu ordering system that lets you automate menu for ordering food in restaurants.In these modern days the number of restaurants are increasing. They also require very fast processing for serving food to the customers. With the increasing number of customers, it would require more man power, since the current situation has become hectic for the restaurants. Also changes in the hardcopy of the menu can't happen. Using simple components and programming techniques, an automation system was proposed.Such system is easy to install and gives a rich environment to the hotels or restaurants.

s by using the computers and giving printed bills instead of handwritten. The customers of restaurants or hotels are always concerned of the time consumed along with the money and taste. The older methods of ordering menus in the hotel industry includes more human efforts for getting the order from customer by giving them the printed menu cards on their table, as well as billing is a great task by giving a special attention to their orders. The Menu card and ordering system using a LCD for displaying and ordering using Matrix Keypad will get a great response from hotels. As it will save time of customers, and it will reduce the human efforts of waiter of collecting menus from customers from their table along with that, waiters will get rid of their great task of giving special attention on each table. This system is smarter to communicate. ZigBee will provide a faster and accurate data transmission in a low cost. The system which is proposed in the paper can be used even by an illiterate people. This system can be used by all range of hotels and restaurants, as its cost of installation is cheaper due to the use of ZigBee communication which is used as a wireless interface and LCD and Matrix keypad as customer interface. The background methodology involves the study about the wireless technologies in the market, alternatives for display methods and also about the bill processing and claim methods. There are various wireless technologies in the market in their category of communication ranges. While choosing a communication technology for out implementation, the first concern to make is, the requirement of communication range. The communication technology to be used should always be enough capable of providing the range of communication as per the application requirement and the frequency band should be enough to carry by the hardware implemented. The next concern about the communication technologies is to choose the less expensive technology which will also satisfy the frequency range. Apart from this all, one more concern is about the modulation technique using in the communication technology. The modulation technique will effects the service quality in data exchange. The next step of research is about the interface/display technologies, the interface involves displaying the menu items on any output device. Since our proposed system consists of a portable handheld device for menu display at every table, it should be always less expensive and easy to operate by anyone. The portable interfaces can be used with microcontroller are having the choices like Alphanumeric LCD display, that it can display alphanumeric characters on it. The research about the billing methods followed by the most of the restaurants is all manual billing method by monitoring the items issued to a particular table, and finally they will issue a paper statement of bill to the customer.

2. LITERATURE SURVEY

Debating about the Indian Railway's Pantry Order Systems, which is totally manual system. Suppose a traveller wants to order any snacks or meal during travelling they cannot get immediate access to seller. Unless and until a vendor comes to take order, due to this process a traveller cannot order at odd time. After ordering the meal costumer have to wait for the bill payments. This drawback can be overcome by this project. It will try to provide the total automation technology. Due to this project the costumer can regimented at odd time and the problems can be solved. In India almost 65 to 75% people travel by the train for long journey and transporting industrial goods from one place to another place. Remaining people uses the other modes of transport such as Roadways, Seaways, Airways. The Conclusion of this project is that the railways are the most important source of the travelling used in India by the people. So it's most probable that our proposed to implement this project in the long journey trains for example, Duranto, superfast and Rajdhani Expresses, etc. as the no. of passengers are increasing gradually, our project can be more useful. If such reliable and feasible service is come into the existence then it will be more helpful for the passengers who travel the long Distance.

Harshada S Wabale introduced Automatic Menu Ordering System utilizing Zigbee and Arm Processor. All the data of suppers and record right off the bat recorded in this framework and director can get all the data from this framework. The client is track by 15693 RFID TAG as ID card. They get table number and dinners data from this tag. The counter uses this framework to take requests of client, and afterward at kitchen side this dinner data is gotten. At the point when the clients go into the eatery they get E-tag from the counter. They can pick any seat from this E-tag and afterward put that E-tag on detecting module on the table. This module will give all the data to framework by Zigbee. From this label framework recognize the situation of the client. Then, at that point server will serve the food as per the needs. B. Shabari, B. Ashok Nayak, August 2015, proposed Zigbee based E-menu requesting framework. The 802.15 Zigbeetechnology is utilized as remote correspondence standard. The framework will comprise of two segments, one is a hand held gadget put on each table in the café and one more segment ought to be put at charging segment and supply area. The paper portrays about the calculation utilized in execution of cutting edge menu requesting framework by with a remote correspondence innovation zigbee and the means engaged with its convention stack. The framework additionally has a touch screen and graphical LCD interface for giving a more brilliant UI menu requesting. Prof.Dr. Usman Ali Shah, Faraz Ali, Sana Sohail, Haris Khan, May 2016, gave Intelligent Robotic Waiter Menu requesting System. The menu card is given utilizing android application. The request will be shipped off the counter comprising of PC through Wi-Fi connect and the subtleties will be saved in the data set of the counter. It expects Graphical User Interface (GUI) progressed contact screen module is used as menu requesting framework. Client can orchestrate through this touch screen device put on each table in eatery. HTML is used for planning pages of café. Kunal P. Gundle, Anuja A. Harshe, Kahol B. kinage, Niraj L. Ghanawat, December 2016, proposed Digital Smart System for Restaurants Using Wireless Technology. A touch based advanced requesting framework comprises of an Android, Bluetooth and GSM. Android upholds mechanization of routine assignments in remote climate. This work intends to give high end food experience to the client. This paper portrays the improvement of advanced shrewd framework utilizing remote innovation for correspondence with incorporated information base for record and an android application for putting request without any sitting tight for server. In this framework they utilized Zigbee CC2530 with My SQL worker information base and Visual Studio C#. All the data of suppers and record right off the bat recorded in this framework and director can get all the data from this framework. The client is track by 15693 RFID TAG as ID card. They get table number and dinners data from this tag. The counter uses this framework to take requests of client, and afterward at kitchen side this dinner data is gotten. At the point when the clients go into the eatery they get E-tag from the counter. They can pick any seat from this E-tag and afterward put that E-tag on

detecting module on the table. This module will give all the data to framework by Zigbee. From this label framework distinguish the situation of the Customer. Then, at that point server will serve the food as per the needs. The proposed framework is an essentially a blend of remote correspondence framework, a data set, and an android application to put in the request. The android application is utilized by the touch screen gadget which fitted at the table. This android application contains all the data identified with menu like image of food thing. The arranged subtleties are shipped off the kitchen and the clerk by remote framework. Android application at the supervisor side is utilized to refresh the menu a focal Database, see and oversee table savvy client's orders, and get criticisms from the customer. The proposed paper features a portion of the restrictions of PDA based food requesting framework and given the arrangement by multi touchable E-café framework. Client needs to provide the request utilizing multitouchable feasting table. This request is ship off all pieces of the eatery. In kitchen gourmet specialists can make food as per request. Clerk can make a bill. Chief likewise utilized this to assess business status like making changes to the food thing. Adobe Flash Action Script 3, PHP prearranging and My SQL data set was utilized to assemble this system. NamrataKakde, VidulaKatambale, ShubhamNamaware: "Remote Hotel Ordering System", International Engineering Research Journal (IERJ), Volume 2, Issue 2019.Now it is the time to articulate the research work with ideas gathered in above steps by adopting any of below suitable approaches: The present technique for menu requesting framework incorporates additional human endeavors for getting a request from the client, by giving the client a menu card on their table and furthermore charging is a unique consideration need to pay for each table and their orders. Thus, the menu requesting through an electronic framework interface will get an extreme reaction from the clients because of the efficient strategy and more intelligent approach to convey. The remote correspondence interface will give a quicker and precise information transmission in a minimal expense. The primary expect to carry out this emenu requesting framework is its easy to use interface just as to decrease human endeavors. The execution of electronic menu requesting frameworks might have a few contrasts in interface plan and strategy. The zig-honey bee correspondence is utilized as remote interface and the graphical LCD show with contact screen is utilized as client interface. In the new past there has been development in requesting and serving framework yet the outcomes are not especially encouraging. With the progression in correspondence innovation the issues of being late engaged can be tackled. To viably run a café, efficient and cost enhancements are fundamental. Decrease on schedule by a couple of moments for each table can accelerate request preparing, increment proficiency and lift benefits. The paper is proposed with the Zigbee innovation as the correspondence medium which carries out quicker requesting framework. The innovation ready to tackle need number of laborer, lessens the blunder on requesting food varieties by the clients. The e-menu food requesting framework depends on programming equipment foundation of Arduino (ATMega328p) and utilizing Zigbee short reach radio correspondence innovations. We have separated the framework in two areas one is handheld segment (client segment) and other is fundamental segment (proprietor segment), both segment comprises of Zigbee handsets. At handheld area GLCD with contact screen is given to submit the request and request sends further to primary segment through Zigbee handset. All the while ringer will demonstrate that request has shown up and LCD show which is at fundamental segment is utilized to show food menu request and cost. Café is a public spot which opens to all to offer food and refreshment to people groups. Café business is quite possibly the most beneficial business. In this way, the significance of food serving is of incredible importance. Throughout the long term, food and the general occupation of serving have developed such a lot of that requirement for help and computerization has been expanded [1]. With the headway of robotization eateries are expected to refresh with programmed framework for saving time in running an eatery. In ongoing café frameworks, the servers keep the record of clients' orders and afterward request goes to kitchen for arrangement. The proposed framework is the café menu requesting framework dependent on Zigbee. Programmed menu requesting

framework through an electronic framework interface can be an ideal answer for work on the fields of café. In conventional cafés the orders are taken from the clients by the servers. Paper menu needs additional human endeavors to get the orders from the clients. The menu cards are set on their tables. Along these lines, customary café framework needs human endeavors and it devours the time. The proposed framework can save time and diminish labor..

3. PROPOSED SYSTEM

The ZigBee based menu ordering system starts working from displaying the menu items available in the restaurant on LCD connected to the Microcontroller at every table in the restaurant. The users can choose any of the item by simply tapping the corresponding item using the Keypad. It will send the corresponding instructions about the selected item to the Microcontroller . Raspberry pi PICO will processes the item details and adds the table number to the data and send it to the order/billing section through ZigBee device. The billing/order section will get the items along with the table number on its display with a buzzer sound to alert the attenders at that particular place. After completion eating or delivery of the items of one table, the customer can request for bill. Then the bill will be calculated by the MAX232 in billing unit and sent to the customer section to the corresponding table. The bill amount will be displayed on the graphical LCD then the customer can know the bill and they can pay it.

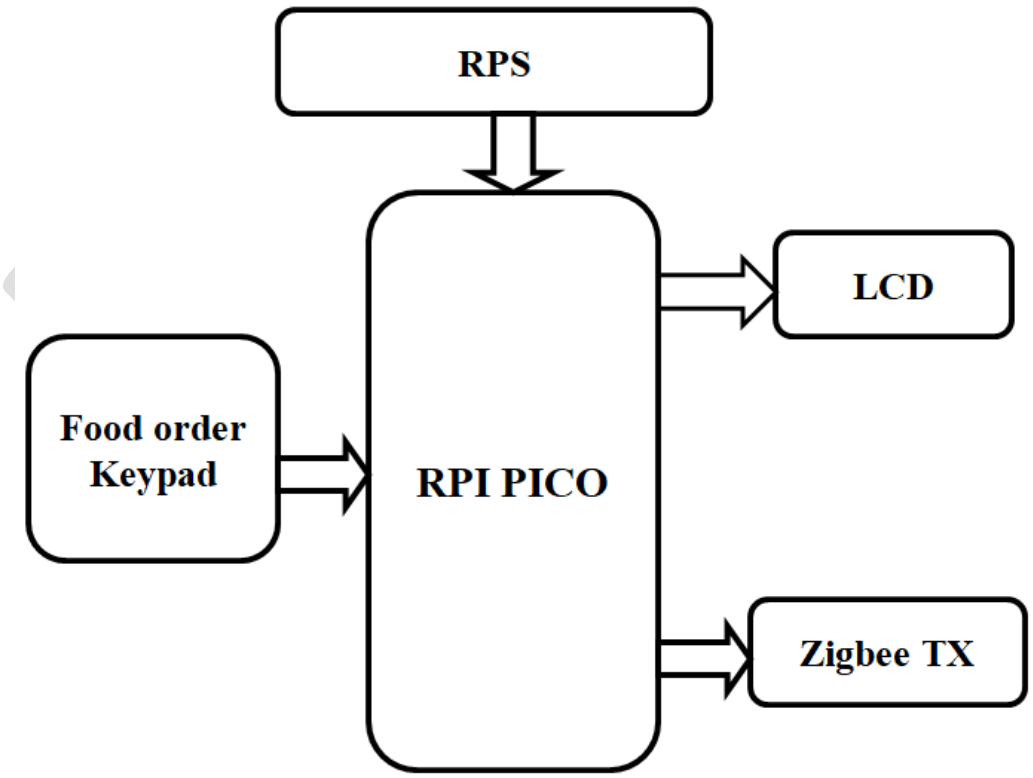

Figure.1.Block diagram Zigbee Transmitter

Automation systems are increase in day to day life. It is the essential part in the field of electronics. It deals with transfer of data from one place to another place. Communication has major role in the successful data transfer and to get the acknowledgement from receiver. There are two mode of transmission; wired and wireless transmission. In wired transmission, data is transferred through a physical medium or a link whereas no physical link is used in wireless transmission. Both mediums have its own characteristics and advantages. Many times when we visit any restaurants due to overcrowded when order is being placed it takes more time to process and increases the man power to overcome such disadvantages a system is being implemented called as automatic hotel order processing system where users table consists of a keypad and LCD display on pressing the relevant code of the food item user can send that to the kitchen where waiter can take the order and send the acknowledgement to the customer. Then waiter serve the menu to the customer on time. Hotel is one where technology and advancements in technology have not been utilized to the fullest potential. Traditional method that is commonly been used in hotels is by taking the customer's orders and writing it down on a piece of paper. Many solutions have been proposed for solving this issue. This project is again one attempt in the same direction. In this paper we discuss the automation for food ordering system. This system makes use of zigbee as a communication device and LCD display module compatible with Aurdino as hardware.

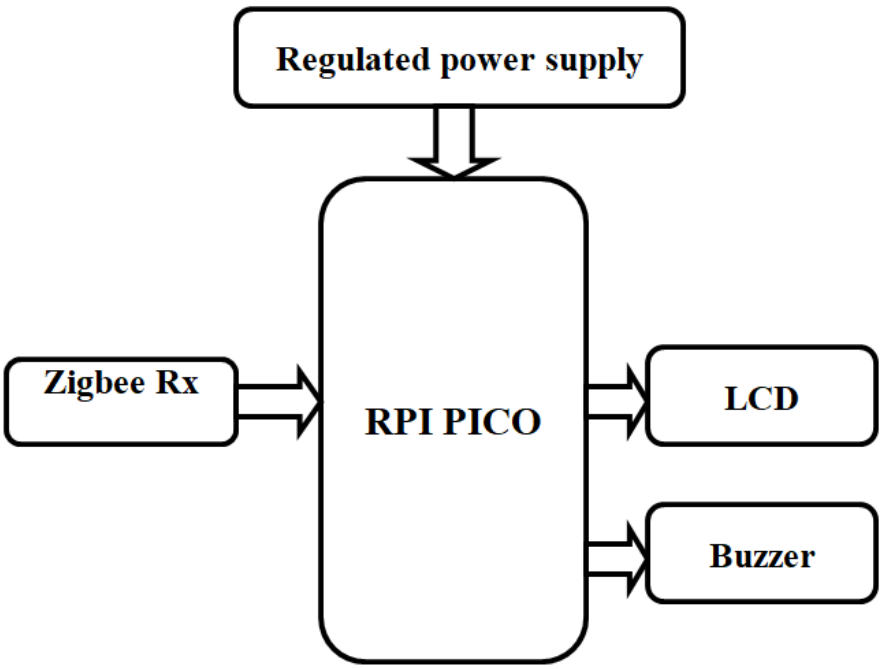

Figure.2: Zigbee Receiver

Customer will observe the menu list of hotel on LCD display. Customer will choose menu of his choice by selecting the respective menu. While doing this, buzzer will ON and LED start blinking which indicates that order has been successfully placed. This order will received by the waiter which will displayed on the LCD placed in kitchen. After receiving order waiter will send acknowledgment to the customer. After getting acknowledgement, customer knows about the confirmation order. If respective menu is not present, then waiter press the Reject button which gives the acknowledgement to the customer about the unavailability of menu or item and Re-order. Waiter serves the menu to the customer. Customer can add additional menu if he want. If customer don't want to take any menu he can press "Exit" button and then massage will come "Are you sure to

pay bill?" When customer press "YES" bill will generated on table. The basic principle of working of system is based on use of a handheld device placed on each table which is used to make an order at the hotel. The system uses a LCD display module which is placed on each customer's table for them to make order. Order is made by selecting the items displayed on LCD. The order will be sent from the customer section using zigbee communication and automatically will be displayed on a screen at the kitchen. The bill will be displayed at customer's table as well as at kitchen. The project will reduce the time spent on making the orders and paying the bills, whereby the cost and man power also can be reduced. The system is start from the customer's table. When the customer is sit on the table system is initialize and display the name of system. The various menus are display on LCD display; customer has to select the quantity of particular food item by pressing noted point on touchpad. If customer wants to increase the quantity then again press the touchpad. After selecting quantities of the entire food items bill is display on the screen. This order is now send to the kitchen side using zigbee. At kitchen after receiving order reply is given to the customer using keypad. Customer is received reply of unavailable food item. Then customer again have to reply back to confirm the order. Then food is served according to the order. The order is also send to the manger also. At manager side after login web page is open which include all the information related to restaurant. Manager can add the food item, check the bill, change username password, and see the remaining food material in the kitchen in short manage all the activity

4. RESULTS

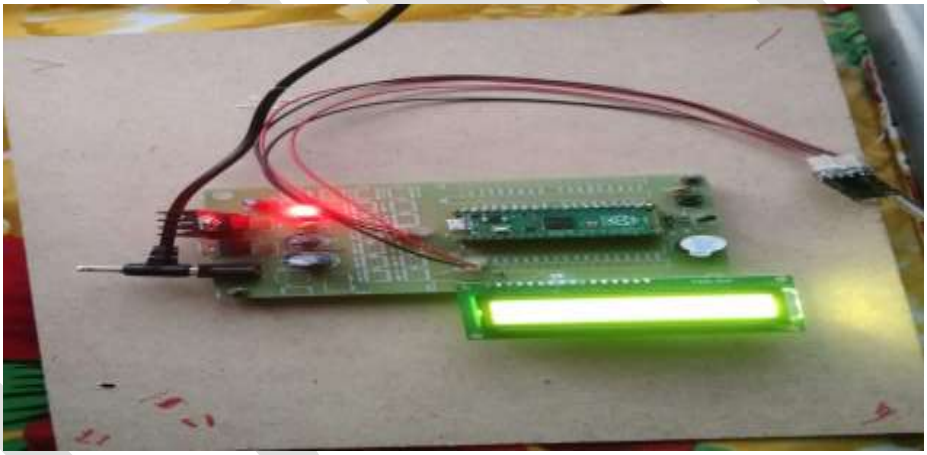

Figure.3: Zigbee Transmitter

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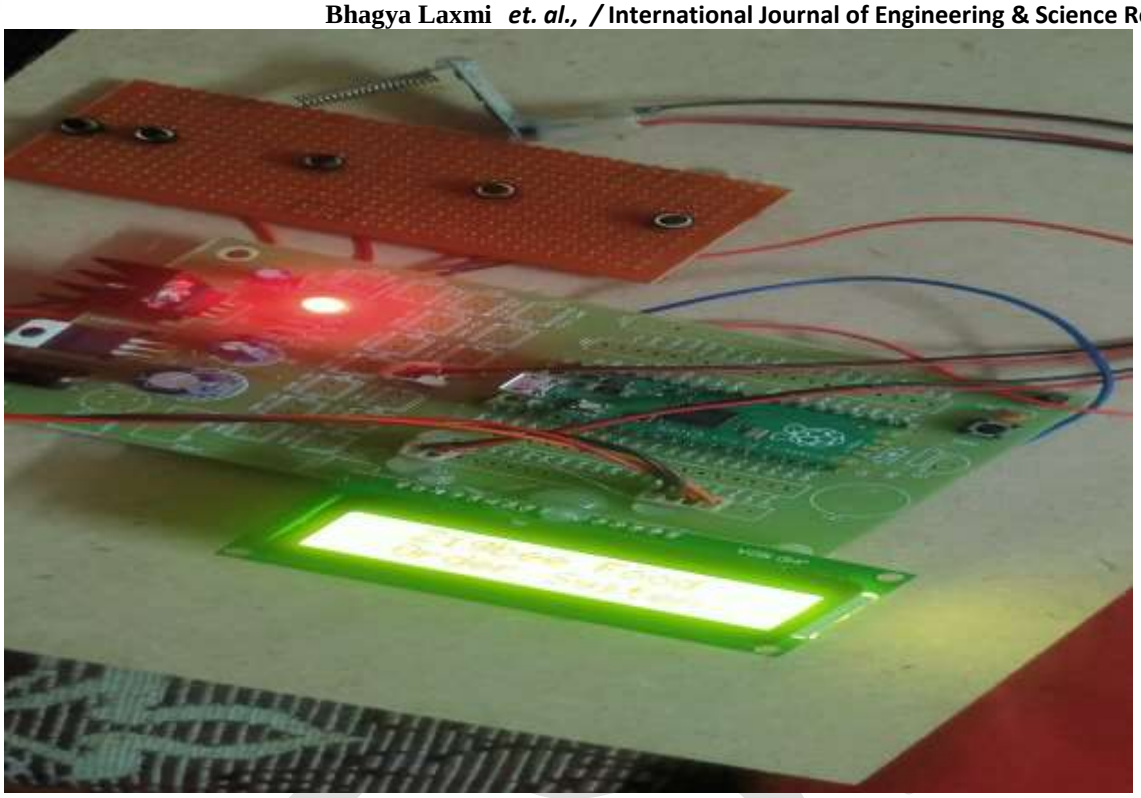

Figure.4: Zigbee Recevier

5. CONCLUSION

He implemented system of restaurant menu ordering system is a modern and smart solution for menu ordering methods in any kind of restaurant. The system will reduce the manual efforts and also gives more accuracy in calculating the bill for each individual table. It is also a low-cost alternative to be used by middle and low level restaurants also. And the proposed system will help in reducing the number of staffs used in the restaurant and also helps to give fast service hence will help in considerably reducing cost and efficient service of restaurant Management

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