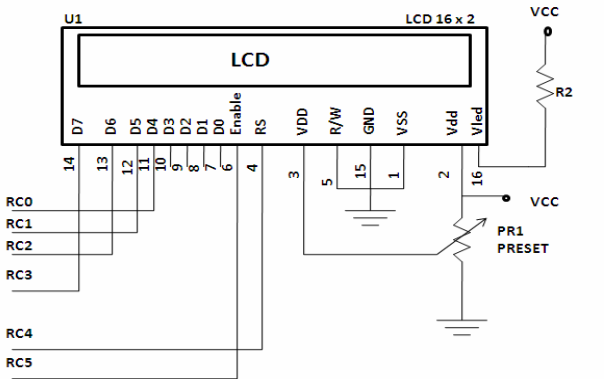

Figure 3.2: LCD Pin Diagram

The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

3.6 Resistive Touch Screen

Resistive touch screens are touch-sensitive computer displays composed of two flexible sheets coated with a resistive material and separated by an air gap or microdots. There are two different types of metallic layers. The first type is called Matrix, in which striped electrodes on substrates such as glass or plastic face each other. The second type is called Analogue which consists of transparent electrodes without any patterning facing each other. As of 2011 analogue offered lowered production costs. When contact is made to the surface of the touch screen, the two sheets are pressed together. On these two sheets there are horizontal and vertical lines that, when pushed together, register the precise location of the touch. Because the touch screen senses input from contact with nearly any object (finger, stylus/pen, palm) resistive touch screens are a type of "passive" technology.

Resistive touch screens typically have high resolution (4096 x 4096 DPI or higher), providing accurate touch control. Because the touch screen responds to pressure on its surface, contact can be made with a finger or any other pointing device.

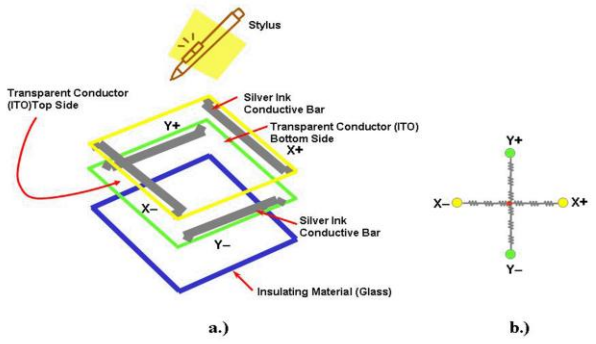

Figure 3.3: Resistive touch Screen

4. Software Design

The programming of LPC2138 ARM controller is with embedded C language using Keil software. Keil software is a great platform for developing embedded C programming for ARM controller. The system flowchart is shown in figure.

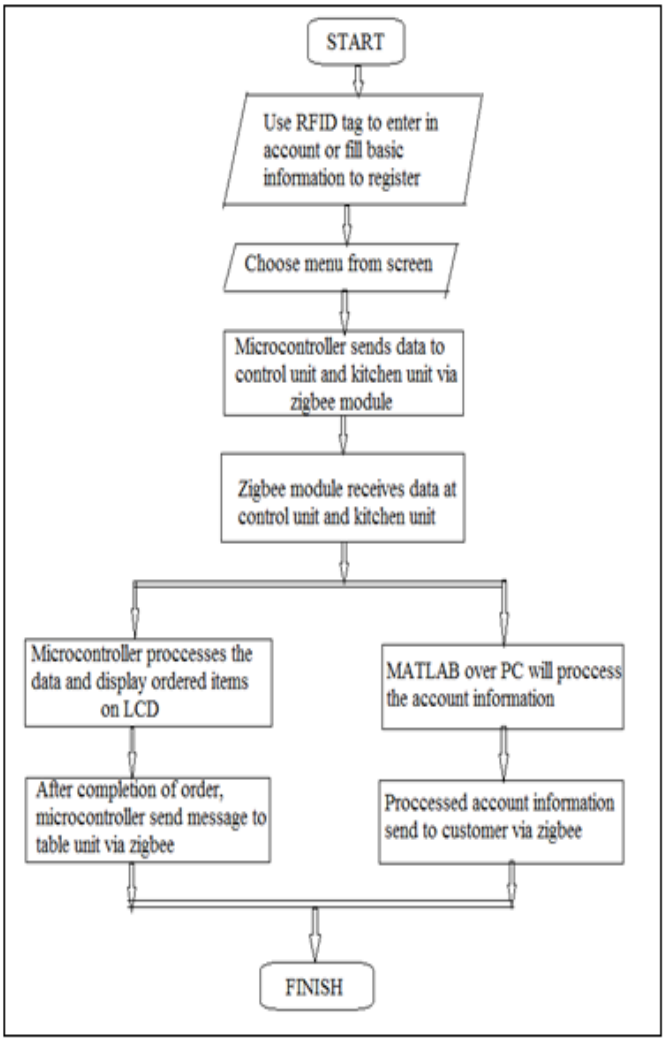

Figure 4.1: System Flowchart

As per figure, Firstly customer would have to register/sign in himself at the table unit using RFID tag which will be processed by ARM controller. At the table side user will select the item from menu using the touch screen. The ARM controller will process the information and will send it to the control unit and kitchen unit at the same time via. Zigbee module. The control unit will process the account information as per the order placed by customer. Also at the same time ordered item will be processed by kitchen unit microcontroller and it will display ordered item on LCD. After the completion of order kitchen unit will send the message to table unit about completion of order and also control unit will send updated account information to table unit.

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5. Results

5.1 Control Unit

Figure 5.1: Front Panel

Figure showing the front panel for the system where we can check the customer ID, name and account balance. This result arises when a user check the balance after login or after deduction in debit of account due to placement of order.

5.2 Table Unit

Figure 5.3: Table unit after login

Figure shows different options for customer after login. Customer can choose the options like Menu card, Balance check and Recharge.

5.3 Kitchen Unit

The item that is ordered and the table number where from it ordered shown in figure. Here we have displayed numbers for food instead of name because of lack of space on display. It also shows the table number from where the order has been placed.

Figure 5.6: ordered item and table no. at kitchen unit

6. Future Scope and Conclusion

Many improvements can be done in the proposed system like the resistive touch screen can be replaced by more responsive capacitive touch screen. Also the one can provide provisions to accept different types of payments like checks, credit cards, debit cards, tips etc. The system can be further extended to register and link multiple restaurants to enhance the dining experience of customers.

The project is aimed to provide a less human effort in restaurants by distance communication using Zigbee. This will make a smart usage of data transfer by reducing the time and man power. This can be used at restaurant, Cinema hall etc.

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