

Smart Menus For Restaurants Using ATmega128

Eeshna Jaiswal, Ramandeep Singh

Abstract -Now a day with increase in number of people choosing to eat out for various reasons, the footfalls at the restaurants have increased. Restaurants like McDonalds, haldiram, etc. are very crowded. So to avoid confusions and other problems at the ordering counter a device is developed. The basic structure of this device is built using a 16x2 LCD, a 4x4 matrix keypad and a microcontroller ATmega128. This would help to take the order at the table only. After taking the order, the device would send the information regarding the order to the kitchen using the principle and method of serial communication. After the confirmation from the kitchen it would return the order number given allotted by the person in the kitchen.

Index terms - Embedded Restaurant, Embedded Menu, Menu using Atmega128, Restaurant using ATmega128, Smart Menu, Smart Restaurants, Smart Menu using Microcontroller.

I. Introduction

Nowadays, we generally see restaurants serving fast-foods or basically the restaurants having self-service facility have a large footfall. This may be because of increase in per capita income of the people these days or, may be because people nowadays prefer to eat out. Though eating out is a very convenient option after hectic day at work but, this easy option can be troublesome by reducing the comfort of eating out by many folds. These largely crowded places can sometimes make ordering things to satisfy our hunger very difficult. The long queues at the ordering counters in restaurants can be a bitter experience sometimes. To avoid such type of a scenario we can ask customers to place orders using this device at the comfort of their seats. Thus this project is made with an objective- to simplify the ordering process for the customers. Therefore we aim to design an embedded system for the restaurants to enable customers to place their orders at their tables. This would enable customers to select the desired dishes from the list displayed on the LCD using the keypad provided. And then after confirming the order a number will be generated, this number will be the order number. Using this number the customer will get to know when his order is ready and can go directly to pick his order from the counter.

This embedded system will help to improve the experience of the customer much better than before. Moreover it will provide ease to them to order at their seats and overcome the tasks of conquering the long queues at the ordering counter. This would be beneficial not only for the restaurants but for the customers as well, because

customers will have a good experience which will make them to come again and again and for the restaurants this behavior by the customers is what every restaurant management team would wish for. Since this device is low-cost and implementation is easy, it will easily find market for itself.

II. Block Diagram

The device components are explained through this block diagram more clearly.

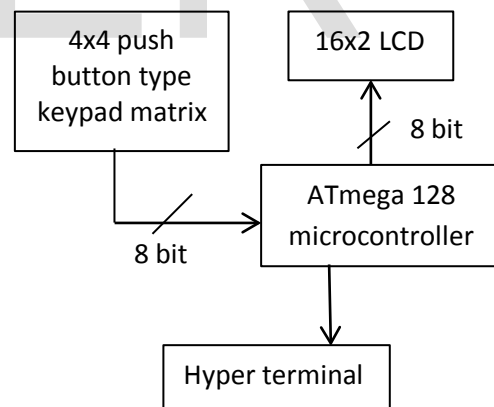


Figure1 Smart menus for restaurants using ATmega 128

As depicted in the diagram the embedded system comprises of a microcontroller which is connected to devices like 16x2 LCD- used for data display, 4x4 push button type keypad- for input and a hyper terminal- for displaying the data received by the serial communication [1]. The basic functioning of this device is that, on power-on the device will flash the menu and other related data already fed into the controller on the LCD. The data transfer between the microcontroller and the LCD is using the method specified in [2]. Next the input given by the user on the keypad will be utilized by the microcontroller

- Eeshna Jaiswal is currently pursuing master's degree program in embedded systems in ITM University, India, PH-9650437211. E-mail: eeshnajaishwal@gmail.com
- Ramandeep Singh is currently assistant professor in EECE department of ITM University, India, E-mail: ramandeepsingh@itmindia.edu

to decide what action has to be taken like, whether to terminate the ordering process or to send data for order confirmation or go to next menu, or go to initial menu. After the ordering process is completed, the required data will be sent through the USART feature of the microcontroller to the required destination i.e., the details of the order will be sent to the kitchen over the communication line. The communication is done serially using RS232 [3],[4] protocol. In this, the device sends the required data to a hyper terminal which plays role of the kitchen of the restaurant for the device.

III. Flowchart

As soon as the device is turned on, the LCD will display “welcome to the restaurant” and will ask the user to input a key to proceed further. This is obtained by connecting the lcd with the microcontroller. The command and data is sent by the microcontroller to lcd

as per the requirement. The functioning of the lcd is controlled by its pin RS, EN, RD/WR [5][6]. Further on the lcd will display that what the customer wants to order drinks snacks, main-course or the desserts. And will take the required input using the 4x4 keypad. The interfacing of the keypad is done in the usual manner. The input of the key is judged by analyzing the rows and the columns one by one. After analyzing the input the required menu will be displayed. According to the data fed into the microcontroller’s ROM. Now, again the user will have to give the input according to his choice for the available options ie, the required key will be pressed according to the menu. After taking the input, it will ask the user whether he wants to order more or not. Depending on the option selected the required step will be performed. After finalizing the order, the order will be confirmed by the user and post-

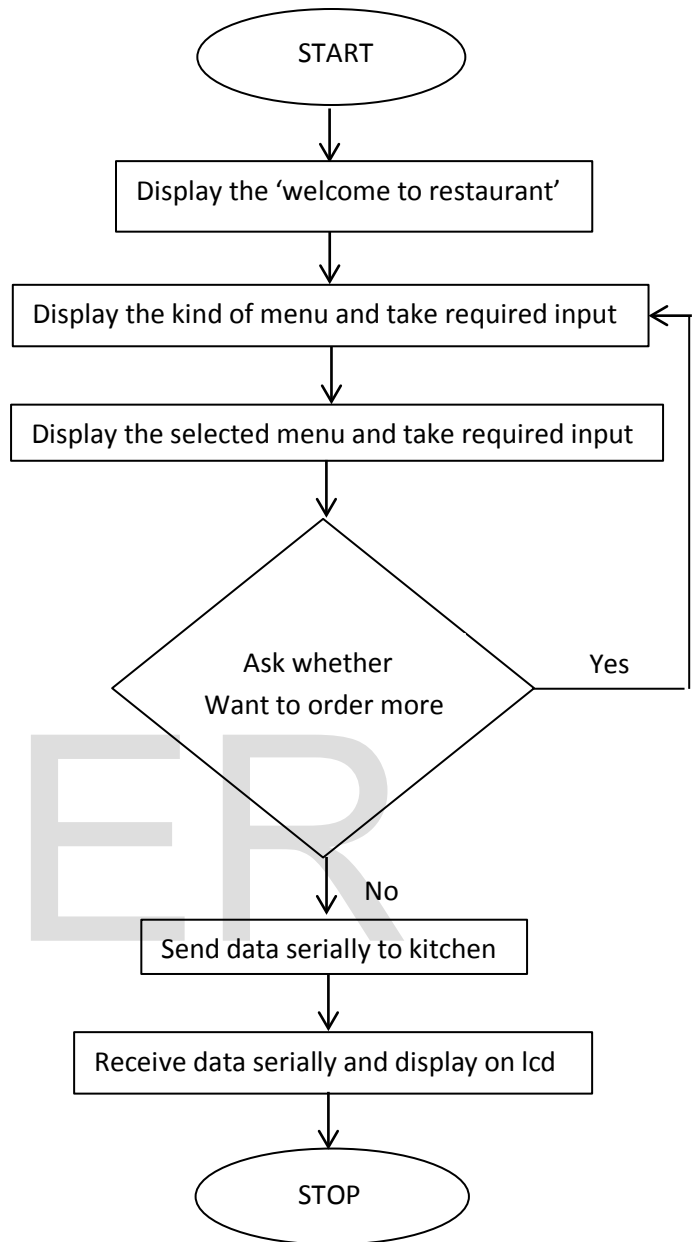


Figure.2 smart menu system for restaurants

confirmation the details of the order will be sent to the kitchen using serial communication [7],[8], from where it will get an order number and the total cost of the food. RS232 protocol will be used for transferring the required data [9]. This data upon receiving will be displayed on the lcd. This number will be used by the customer to get his order and pay his bill at once while collecting the food. All connections were made accordingly [10], [11].

IV. Hardware Considerations

Table 1.
hardware considerations of the smart menu system

Port name	Function/ description	Type
A	Lcd	Output
B	Keypad	Input
C.1	Led	Output
C.2	Buzzer	Output

V. Embedded User Interface

Whenever the device is turned on the following screen will be displayed on the lcd

Welcum to restrau
Press *to cntinu

Figure 3 screen 1

The next screen will be displayed only after '*' is entered by the customer

Select as choice
1drinks 2 snacks

Figure 4 screen 2

3main 4desserts
Enter no.

Figure 5 screen 3

The next screen will be displayed only when the customer enters a legal choice. After the input is done the following type of screen will be observed on the lcd by the user

You selected 1

Figure 6 screen 4

Now according to the choice of menu selected the details of it will be displayed on the screen

1lemonade 2tea
3coffee 4juice

Figure 7 screen 5

5coldcoffe 6soda
7aerateddrinks

Figure 8 screen 6

Enter no.

Figure 9 screen 7

The next screen will be displayed only after a legal input ,now according to the choice entered, the item will be displayed along with its price.

You selected 5
Coldkoffe- 70

Figure 10 screen 8

After displaying the above screen, it will ask whether the customer wants to order more or not.

Do you want to
Enter more 1v 2n

Figure 11 screen 9

The next screen observed upon input made by the customer

You entered 2-n

Figure 12 screen 10

Since the customer entered 2 which represents no i.e, it doesnt want to order more, he will be asked to cofirm his order

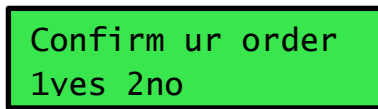


Figure 13 screen 11

The next screen upon input depending upon the input, since the input was 1 which was yes, the screen

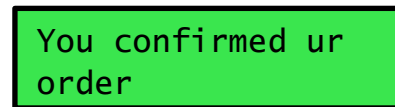


Figure 14 screen 12

Now since the order is confirmed the details of it will be sent to the kitchen serially, and the data received from the kitchen will be displayed on the lcd



Figure 15 screen 13

VI. Applications

This device can not only be used for ordering in restaurants but also, can be used in movie halls for ordering snacks in the hall itself while the customer is seated on his sofa. Also in offices where order can be placed from one's cubicle or cabin itself, canteens, hotels(incase of placing order on telephone lines it can be placed using this device from the room), etc.

VII. Advantages and Limitations

It reduces man power thus, reduces the cost of employment [12] of the people who take orders and chances of error which may arise due to them. Over a period of time the investment cost of the device is compensated by the savings from salary amount of the people. It also results in less chaos at the counters. Moreover it can also attract customers [13], [14] due to time saving and simplicity.

The only problem which can be faced is incase of system failure or when the client is technically challenged

VIII. Result

The device was developed and successfully tested.



Figure 16: Screen observed on hardware upon power-on

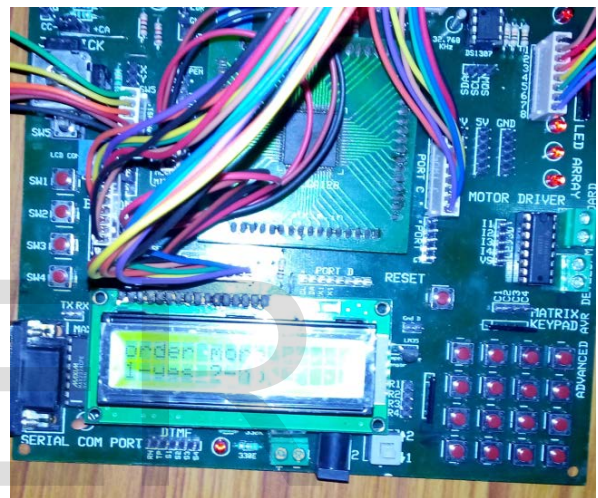


Figure 17: Actual obtained hardware

IX. Conclusion and Future Scope

The device is very easy to execute and very much user friendly. The method to setup this device system in a restaurant is not very complex. Moreover this system is very much cost efficient.

We can add thermal printers to give the print out of the order number to the customer. Also, we can add devices to include the feature of card facility to make payments at there itself. Also the display options can be improved. Devices like tft lcd[15], graphical lcd [16] can be used.

X. Acknowledgement

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