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Hardware Implementation of Automated Pantry Order System using ZIGBEE

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Abstract
This paper gives the brief introduction to the Automated Pantry Order System using ZIGBEE. This Paper is mainly focusing on hardware implementation of the proposed system. Various requirements to design the hardware simulation model are explained with software required along with the supporting softwares
The designed simulation model is shown in the paper. Also, the step wise execution of the simulation model with the respective images is briefly mentioned. And idea of ordering the food with the proposed system is cleared with this paper in brief.

Keywords: Simulation model, ZIGBEE, Proposed system, Ordering, etc.

Introduction

In this paper the designing of hardware simulation model of Automated Pantry Order System using ZIGBEE is mainly focused. This system provides an automated wireless pantry order system using ZIGBEE module. System is providing each bogie/compartment with a microcontroller based order placement unit. The unit is having a keypad to browse through the menu. The menu items will be displayed on the LCD connected to microcontroller. User can navigate through menu using keypad provided. The order placed will be transmitted to the central computer (PC) which will also have a ZIGBEE module connected to it for data reception. In this way the order will be placed and immediately it will be served to the passenger by service provider. And the simulation model of above system is mentioned in this paper.

Requirements to Design the Simulation Model
Software used

1. Atmel Studio
2. Proteus 7/8

Supporting softwares

1. Dot net
2. VSISO Shell

For designing the hardware of our proposed automated pantry order system, the simulation model of it is prepared. For that purpose the above mentioned softwares as Atmel Studio is required for compiling the code as compiler software. In this software the code required for the hardware is compiled and executed. After the successful execution of code, the respective hex file will be generated. That generated hex file will be given to the controller in the simulation model. The complete simulation model will be working on the same hex file which is generated by Atmel Studio. This is the significance of Atmel Studio. Also the supporting softwares are mentioned above without which Atmel Studio can not work. These are the mandatory requirements of Atmel Studio to be installed with it.

After that Proteus 7 or Proteus 8 can be used for the designing of simulation model. In this software one can make the hardware design. Generally these simulation designs are made to test the proposed model with results before the actual implementation on hardware. So that, the further actual design should work correct and properly. This software is having it's own various tools (inbuilt) in it. So by using these tools simulation model for Automated Pantry Order System is designed. The simulation model with it's step wise execution is shown in the figures below.
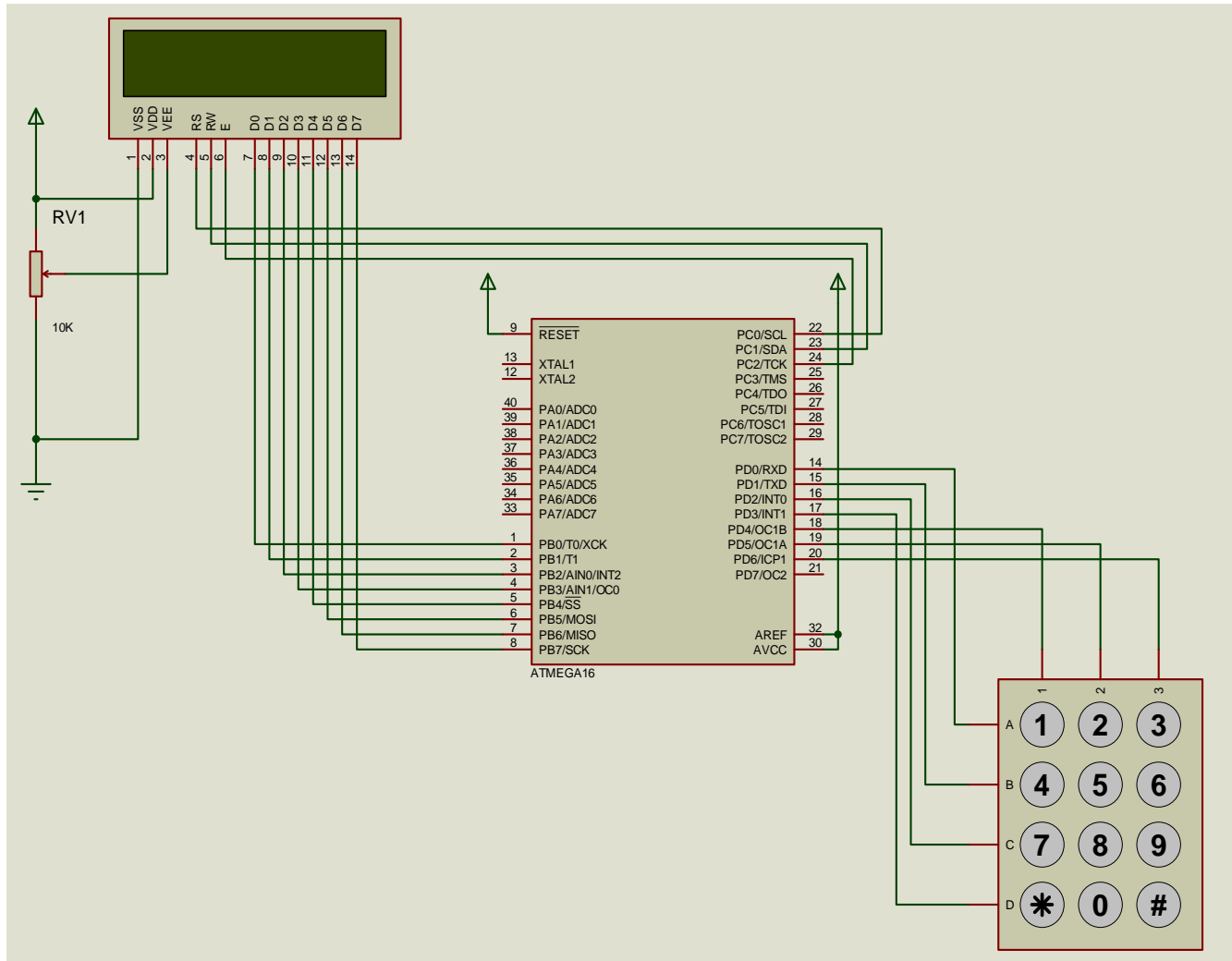
Simulation Model

Figure 1: Simulation Model

The above figure 1 is showing the simulation model for Automated Pantry Order System using ZIGBEE. In which LCD display is used for displaying the menus and browse through the menus. Keypad is interfaced with the controller for entering the input data. For further requirements ZIGBEE will be connected to the transmitter receiver pins. And keypad can also be interchanged to other ports of microcontroller. Finally the most important component is Atmega16 controller for controlling and operating the whole system. Now the working of this model that how it works is shown in the figures below.

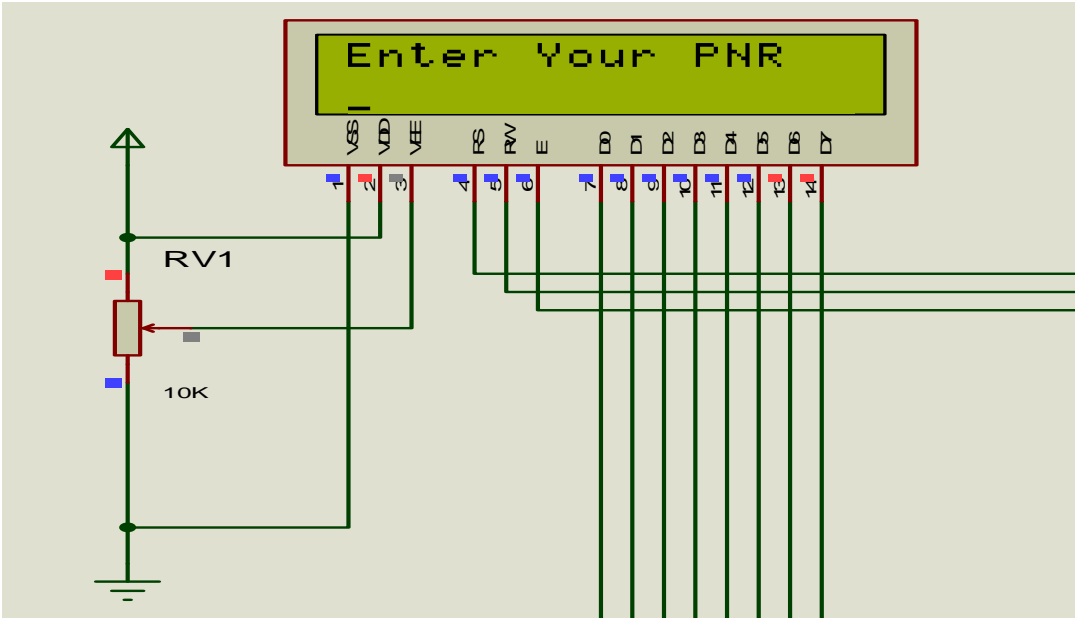## Step Wise Execution of the Model

Step 1

Figure 2: Step 1(a)

The above snapshot in the figure 2 is showing the image of display on which "Enter Your PNR" string is displayed, which is step 1(a) of execution. And step 1(b) is shown in figure 3 below in which PNR number is entered. Followed by step 2 in which coach number is asked.
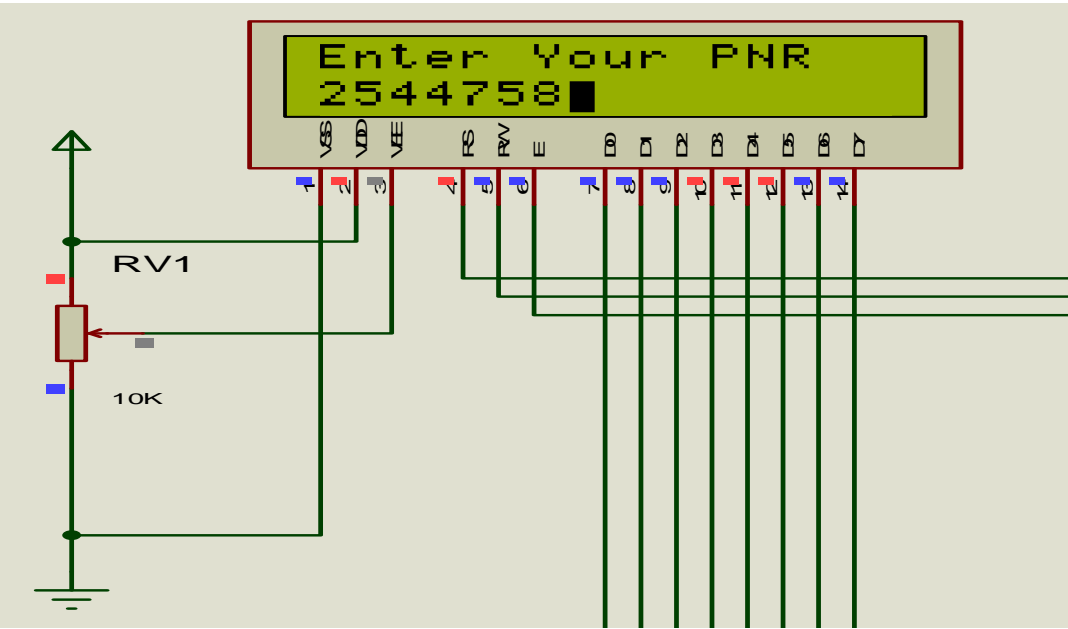

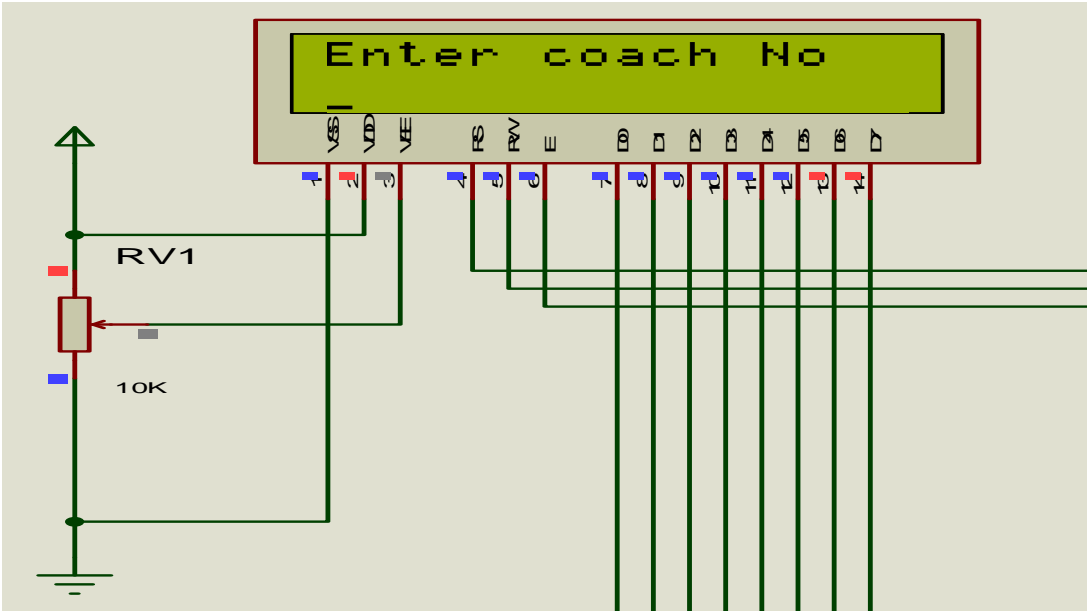**Figure 3: Step 1(b)**

Step 2

Figure 4: Step 2(a)

The above figure 4 is showing step 2(a) in which string "Enter Coach No" is displayed. And step 2(b) in figure 5 is showing the display with entered coach number followed by further steps below.
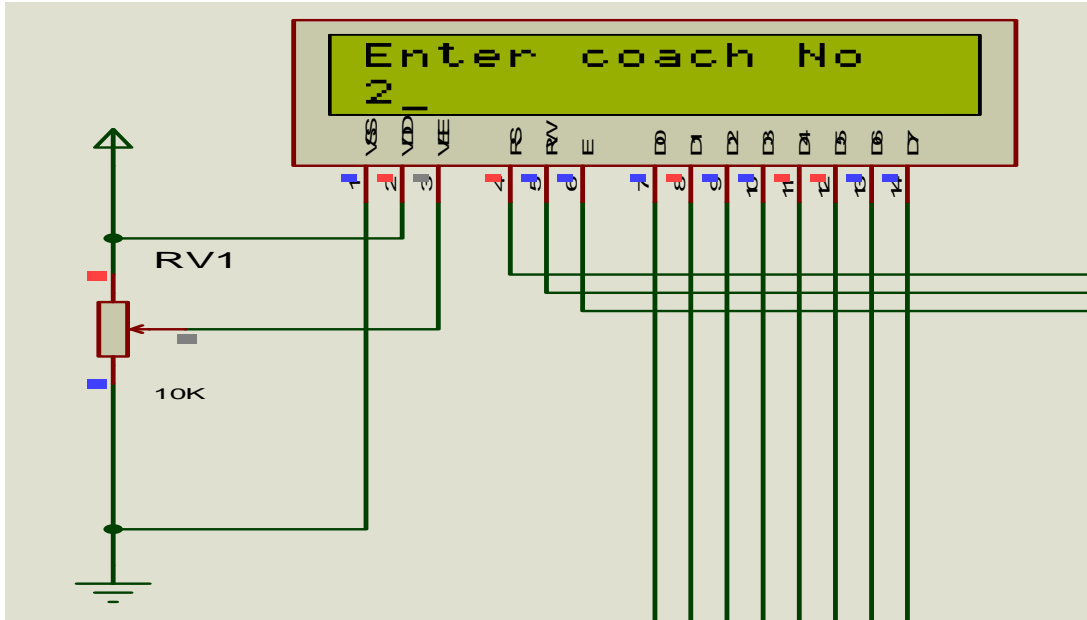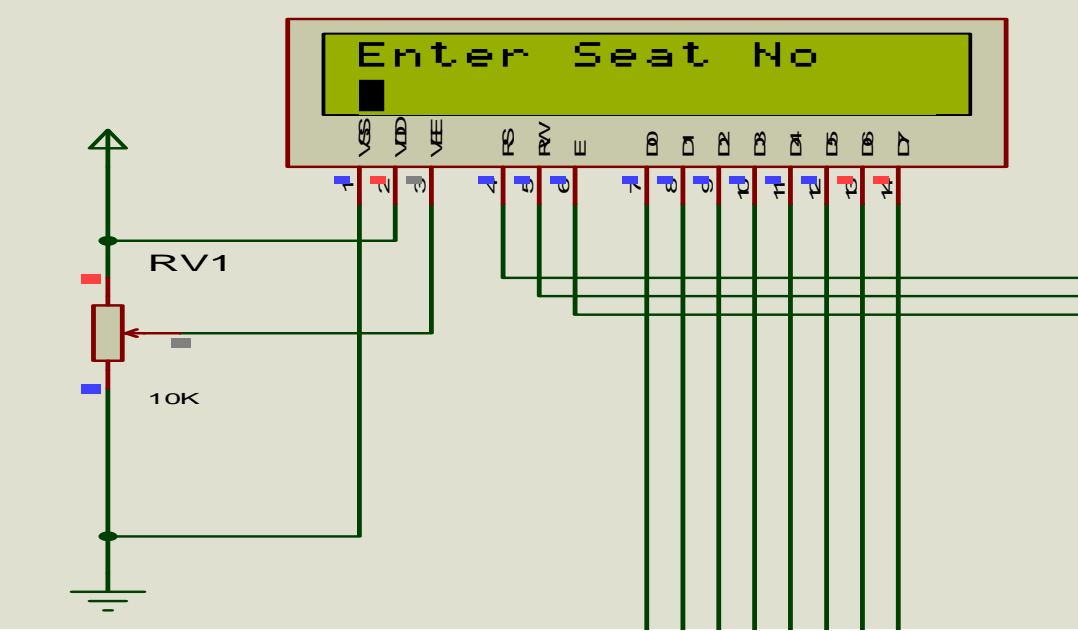

Figure 5: Step 2(b)

Step 3

Figure 6: Step 3(a)

In step 3(a) string "Enter Seat No" is displayed and in step 3(b) and the display with entered seat number is shown in figure 6 and figure 7 respectively. In the next step as soon as the seat number is entered, menu list will be displayed. Out of these menus one should select the menu and order it.
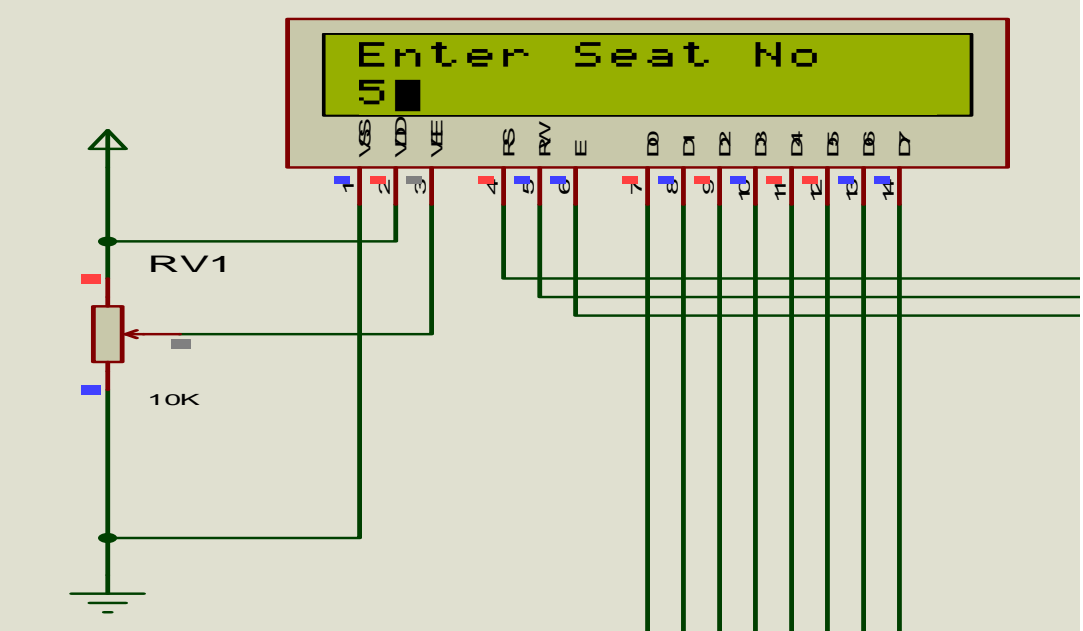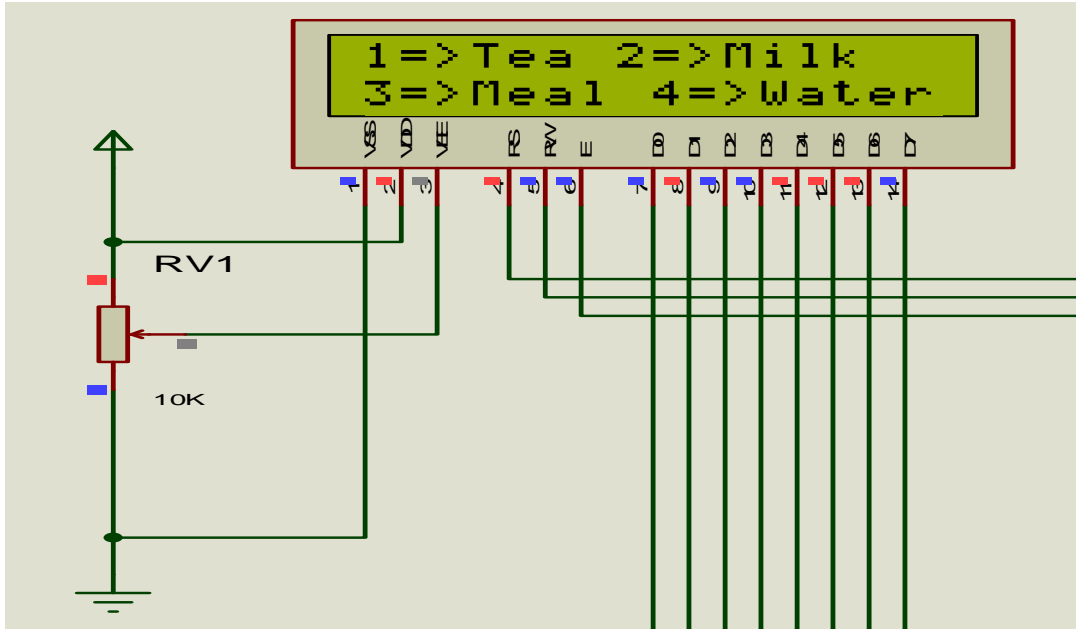

Figure 7: Step 3(b)

Step 4

Figure 8: Step 4(a)

In the above figure 8 various menus available in the train pantry car are displayed on the screen of LCD display. Out of these, menus will be selected depending on the requirement of passenger. Menu can be ordered by pressing the key numbers in front of the respective menu items. And after finalizing the order, the following message will be displayed on the display as shown in the figure 9 below.
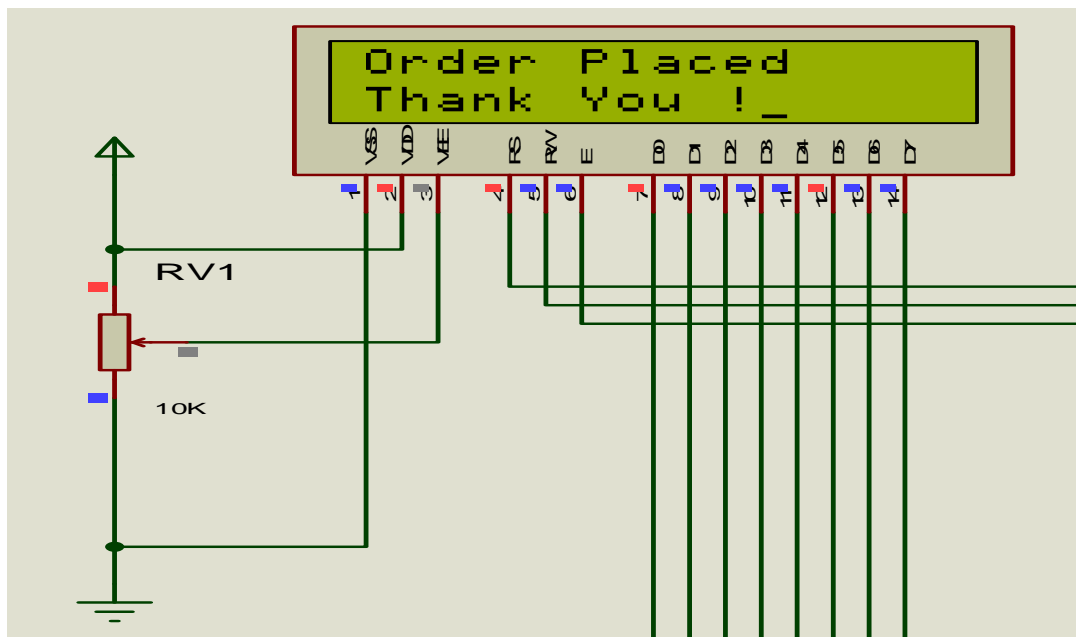

Figure 9: Step 4(b)

The above message will be displayed as soon as passenger completes the steps of ordering the food and finalize the order. The string "Order Placed" and string "Thank You!" will be displayed on the display. And within a very short time the ordered food will be served to the passenger by the service provider or waiter.

Conclusion

In this paper introduction to pantry order system is given with the hardware implementation of the proposed system. Various software requirements to design the simulation model is mentioned in the paper. The designed simulation model with it's various steps of execution are mentioned with the respective snapshots in the above paper.

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