

# Smart Notice Board Using GSM Enriched With Green Energy

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**Abstract** - The main aim of this project is to update the information in the solar power enriched notice board display by passing circular through converting into voice to text message by software application technique via computer and the mobile phones based on GSM. The number of SMS messages exchanged every day is enormous. SMS messaging is now one of the most important revenue sources of carriers. Looking into the present trend of the information transfer vital notice board take time to display. This latency is not anticipated in most of the cases and must be avoided. This project Presents a combination of wireless technology with LED Display Boards formalized by designing and integrating the hardware and software with PIC18F4550, GSM Module moving LED display and Solar Pannel. This proposed design overcomes the difficulties faced by previous moving text message display modules using wired entry via computer. The message is sent through the cell phone or software application which is accepted by GSM sim (300). The message will be valid only after the incoming cell phone number and password given by the software application is validated. Further the same message is itself sent by GSM module to multiple LED display Boards which are connected via different GSM modules. The incoming number and the message stored in the EEPROM so that no previous message is lost.

**Keywords** - GSM Module, PIC Micrcontroller-18f45550, LED Display, Solar panel, keypad & SMS.

## 1. INTRODUCTION

Notice Board is primary thing in any organization or public utility places like bus stations, Railway stations and parks. But sticking various notices day-today is a difficult process. A separate person is required to take care of this notice to display. This project deals about an advanced hi-tech wireless notice board.

This project aims at developing a system that will display the message received by the GSM module. PIC controller will then control the system by doing verification and thus making it more secure than the other display systems. GSM (Global System for Mobile communication) network is among the most widely used communication networks today for calling or messaging.

It was observed that technological capabilities of cellular phones have varied widely during last decade from simple voice and messaging features to very powerful ones and connection interface have varied from simple RS-232c

based data link. Additionally, it establishes wireless communication between voice to text message conversion and PIC controller based on GSM.

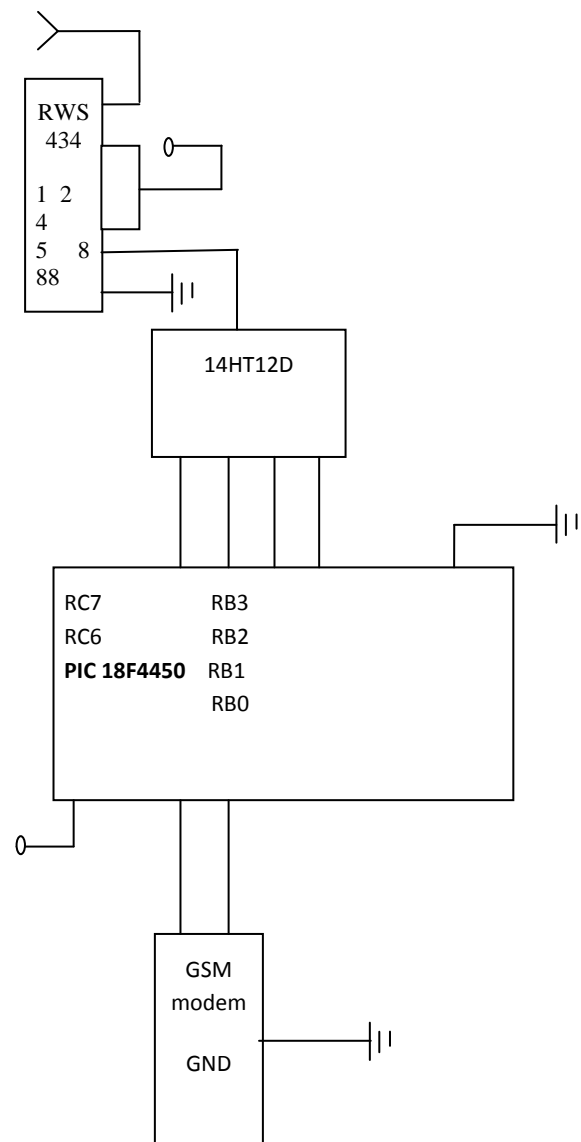


Figure1. Interfacing of GSM with Controller

The main advantages are,

- Reduced paper usage
- Reduced man power
- Accurate and faster receivable of information .

- Solar cells which are used in this system needs no fuel and produce no wastes

Firstly the circuit is designed in order to connect GSM module to PC through PIC Microcontroller-18f4550 circuit and a communication link was created via HYPERTERMINAL as shown in Figure 1.

## 2. RELATED WORKS

Currently, the moving text message display modules are using wireless entry via computer or PC keyboard or remote control. This paper presents an experiment to give a start to the era of real-time noticing with renewable energy resources. This paper discusses about writing or converting the voice to text message which is to be displayed in mobile and send it to the sms to another side. This received message is fetched into PIC Microcontroller and after authentication it is displayed on LED screen.

This project, focused on application of LED in graphic displays. Main target of designed and manufactured systems was its versatility. This project, focused on application of LED in graphic displays. Main target of designed and manufactured systems was its versatility. The receiver part is an integration of Power supply unit (12V,5V), GSM module SIM (300), PIC 16F4550, moving LED display, keypad, MAX232, PS-2 connector and resistors. PIC microcontroller is preferred over other microcontrollers because single cycle execution with 2 clock cycles, or 4 clock cycles in 8-bit models and addressable data space with 32, 128, or 256 bytes.

This project has facilities to integrate GSM module with a moving LED display board thus making it really wireless. This system accepts the SMS, stores it, validates it and then displays it on the moving LED display module.

The validation depends upon the stored numbers in EEPROM which are compared with the incoming number. The numbers stored in EEPROM can be edited by keypad provided separately. The key constraints included are the use of “#” as the end termination of the SMS. Multiple moving LED displays are connected via different GSM modules at different geographical positions so that one and the same SMS will be displayed on all moving LED displays.

## 3. BLOCK DIAGRAM

The block diagram has been shown in Figure 2. It consists of two parts called Transmitter and Receiver. Cell phone and Voice to text conversion based on GSM acts as the transmitter which is used to send SMS to the receiver part. The cell-phone has a SIM (Subscriber Identity Module) card which is used to send SMS to the SIM

card present in the GSM module (master) at receiver end. The GSM module which acts as master on the receiver end utilizes different AT commands for different operations as shown in Figure 2. The SMS is then received by PIC microcontroller which is in the form of ASCII characters.

Now a days, thousands of man hours are devoted to simply converting tapes of business meetings, medical notes and general observations into a format that will be easy for everyone to use and understand. Voice to text conversion specialized programs to recognize a speaker's voice and automatically convert that speech to usable text by using VB.Net in c-sharp. Thus in order to use speech to text in Microsoft Word, we use to have both the Word program and the speech operating program as shown in figure 3. The default Windows program, Speech Recognition can be set up to operate in the background, to get it started, say "Start listening."

As shown in figure 3. It consists of recording device, personal computer, internet connection and software application to convert the speech to text. At first the recording device records the speech signal. Later the speech signal is converted into the text by using the software application based on the internet upload using VB.Net.

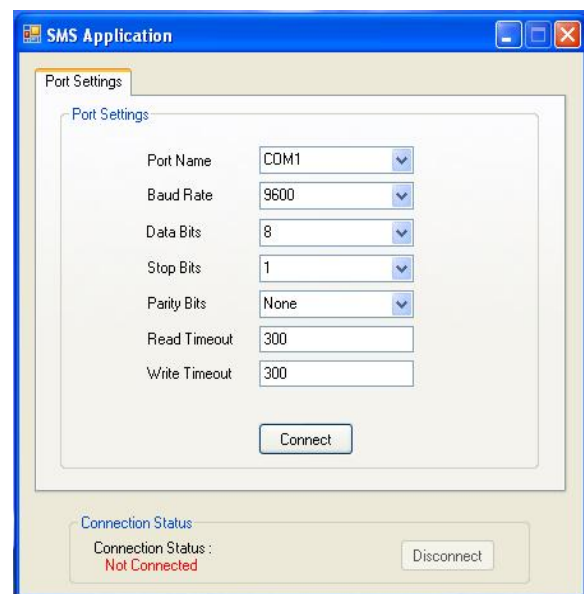


Figure 4. Port to be selected

box, it is divided into four tabs Thus in order to connect the dialog box, choose the COM port in mobile phone or GSM modem is connecting to dialog box Interfacing with GSM COM 1 port should be selected in PC with 9600 baud rates ,8 data bits ,stop bits as1.In this tab, Port settings which will be the same as we did in the hyper terminal and then click the OK button. If the modem is connected successfully, a message box will appear with the message “Modem is connected”.

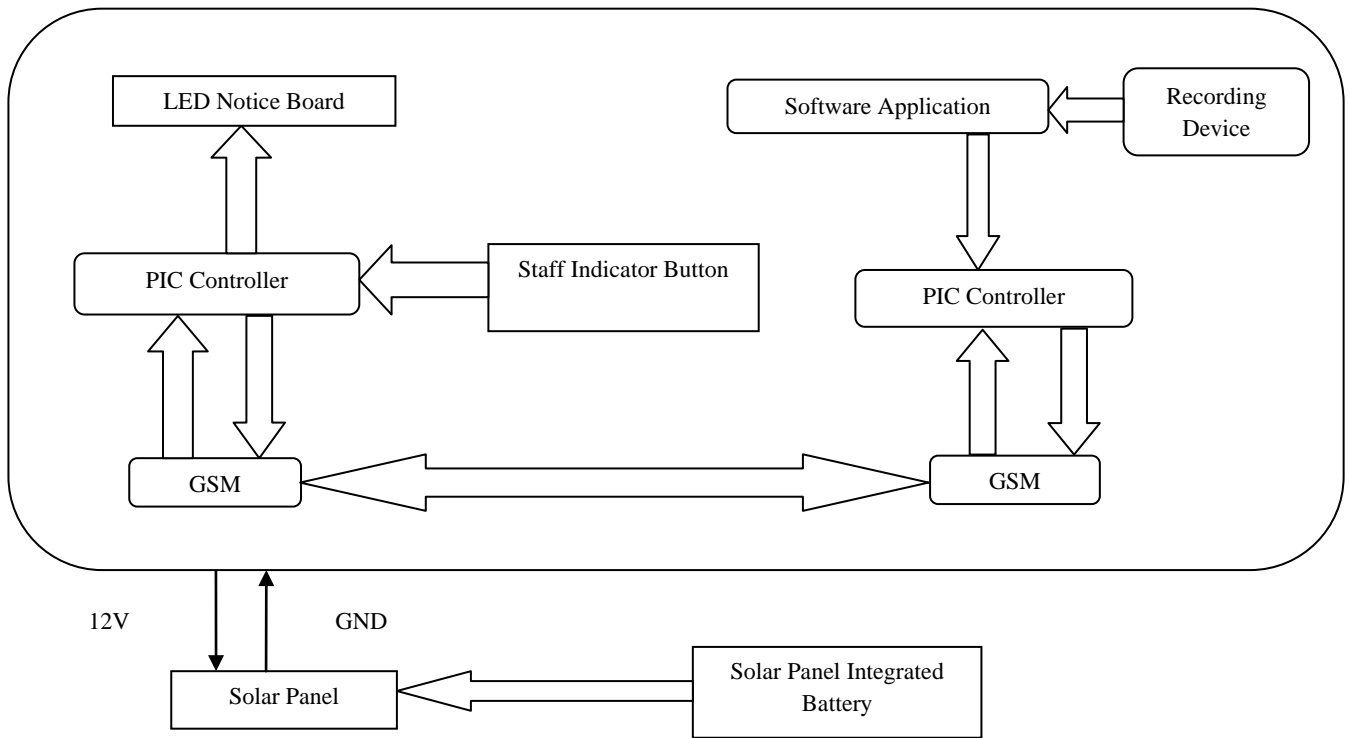


Figure 2. Overall Block Diagram of Smart Notice Board

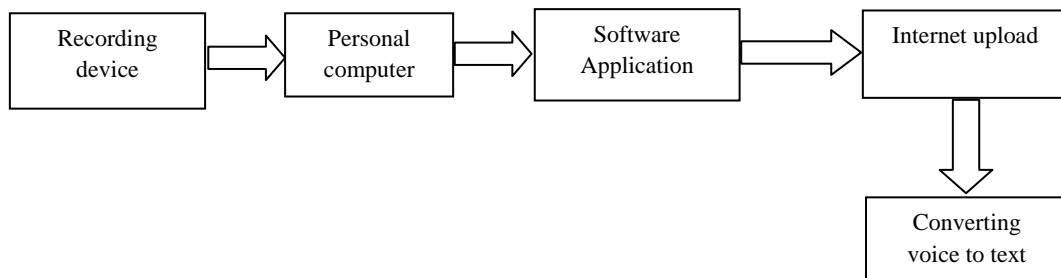


Figure 3. Block diagram Voice to Text Conversion

As shown in Figure 4. Interfacing with GSM to dialog  
After the port is selected the second dialog box is open.

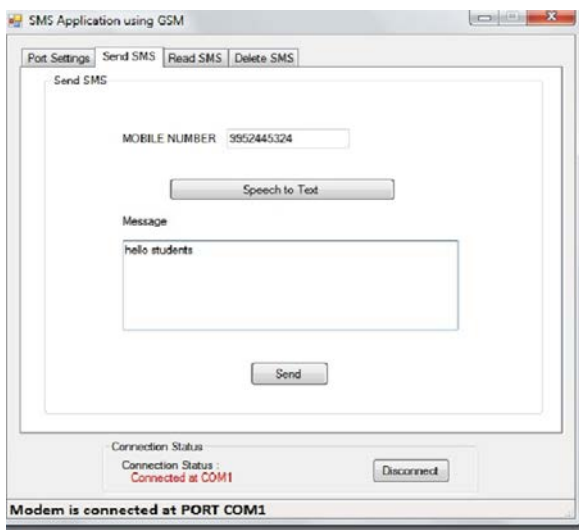


Figure 5. SMS is been Send

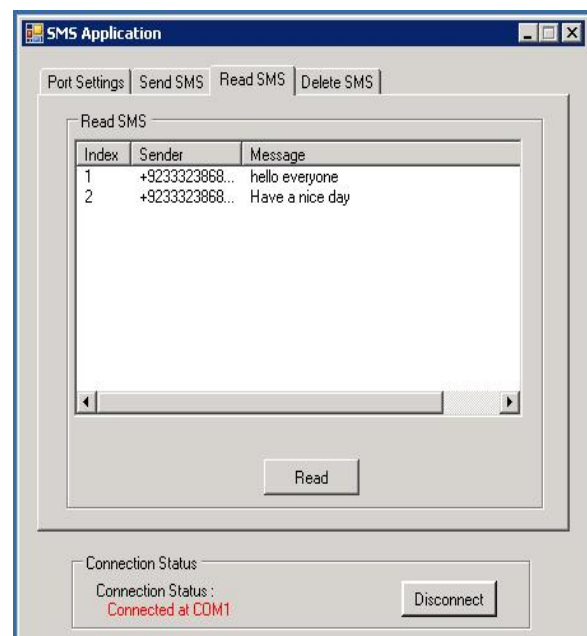


Figure 6. Read SMS

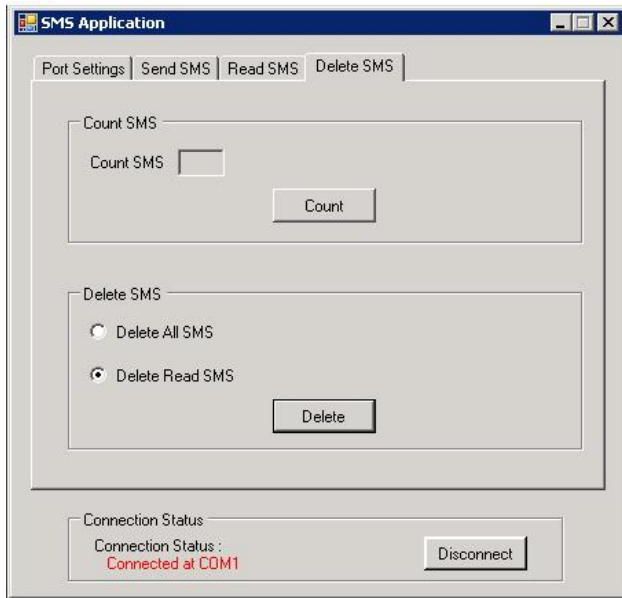


Figure 7. Message is been deleted

In this tab, the message format will select writing or converting voice to text conversion as shown in figure 5. In third tab, the message should be read in figure 6. The saved messages should be deleted in the fourth tab as shown in figure 7.

Table 1. Commands used in GSM

Commands	Meaning
AT+CSQ	Signal strength
AT+CMGF	Select SMS message format
AT+CLIP	Calling line identification
AT+CNMI	Calling new message indications
AT+CMT	Short message to output directly

#### 4. GSM BASED LED DISPLAY METHODOLOGY

Figure 8 shows the Software Methodology. Firstly, the software checks for whether OK/SAVE key is pressed on keypad. If OK/SAVE is pressed it goes into the subroutine where the numbers can be saved or edited through keypad in EEPROM to which GSM module sends SMS. If OK/SAVE is not pressed signal strength is displayed on LED. After this it checks whether MENU key is pressed or not on keypad. If it is pressed then software goes in the subroutine of password matching. If it is not pressed then it keeps on showing signal strength. If password is found matched then the numbers can be saved or edited through keypad in EEPROM from which GSM

module receives SMS. If password does not matches buzzer beeps three times and again shows signal strength on LED. GSM module always checks for incoming SMS.

On receiving an SMS, firstly microcontroller saves SMS and number from which SMS is received. Then it compares this number with the numbers stored in EEPROM. If number matches, „Matched“ is displayed on LED if not then „Not matched“ is not displayed. After matching the numbers, microcontroller checks for the code “#”. If it is there in SMS, it displays previous SMS which is stored in EEPROM on Moving LED Display. If SMS is other then this code then that SMS gets stored in EEPROM and is displayed on Moving LED Display. Finally, this received SMS is forwarded to numbers stored in EEPROM by GSM module.

#### 5. RESULTS AND DISCUSSION

As shown in figure 10 is .the simulation diagram for GSM interfacing with the PIC microcontroller.

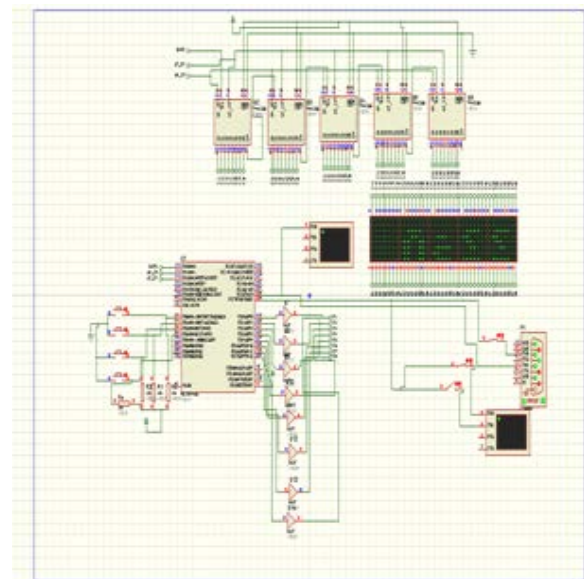


Figure 9. Proteus Simulation for GSM Interfacing

GSM was designed with a moderate level of service security. The system was designed to authenticate the subscriber using a pre-shared key and challenge-response. Communications between the subscriber and the base station can be encrypted.

The development of UMTS introduces an optional Universal Subscriber Identity Module (USIM), that uses a longer authentication key to give greater security, as well as mutually authenticating the network and the user, whereas GSM only authenticates the user to the network. At first voice is converted into text as shown in Figure 10.

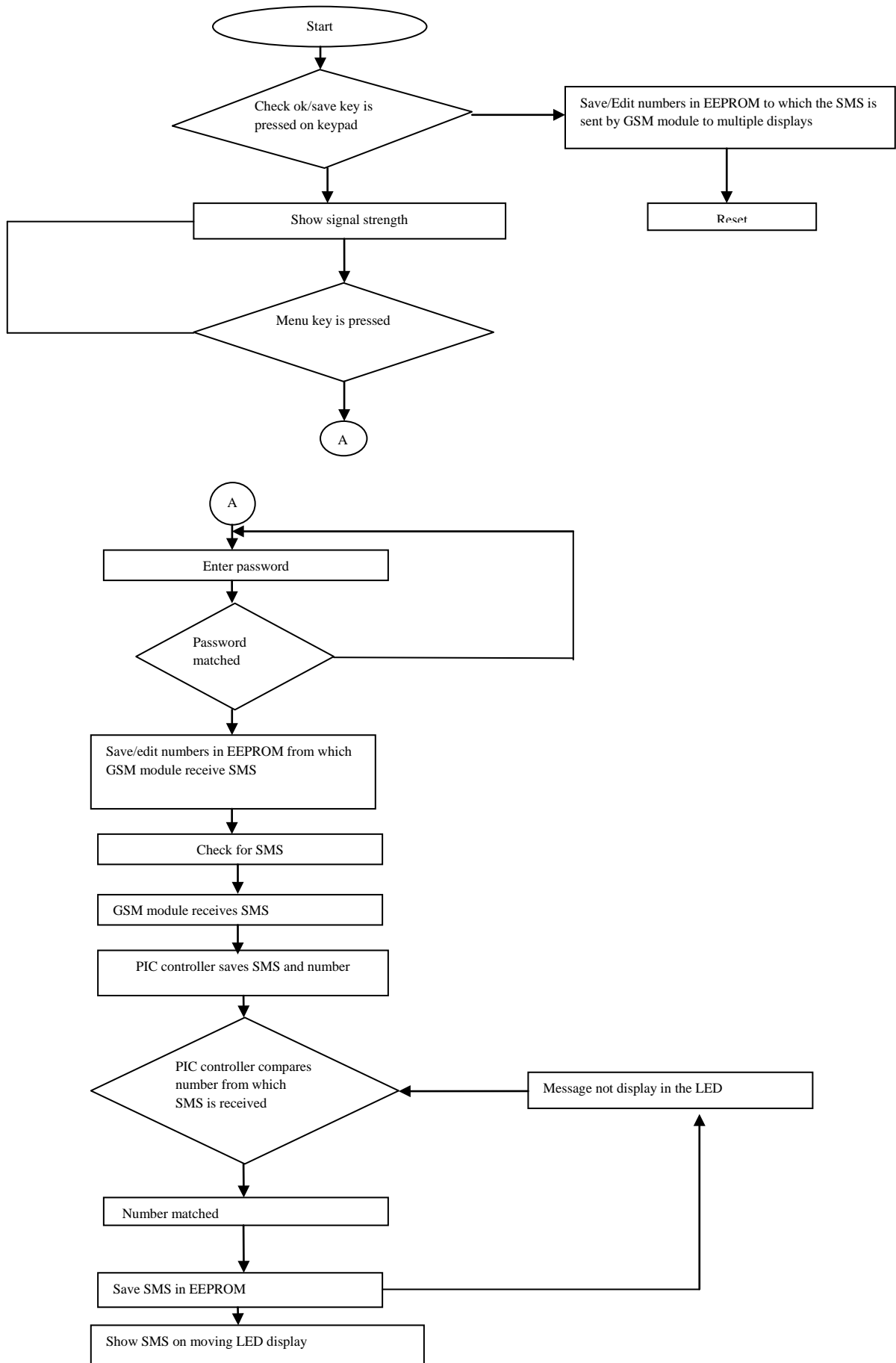


Figure 8. Software Flow Chart

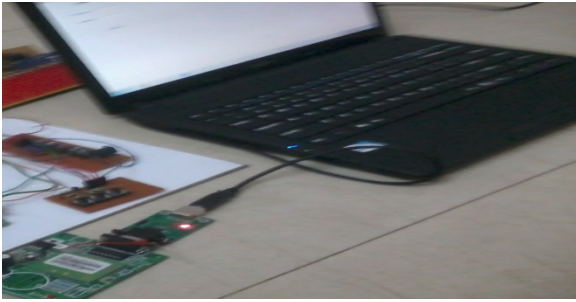


Figure 10. SMS send to SIM present in GSM module by the stored number

At first the message is send through mobile phone as shown in Figure 11.

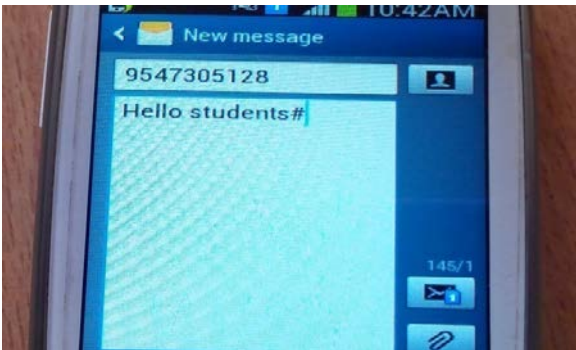


Figure 11. SMS send to SIM present in GSM module

When GSM module receives an SMS with “ # ” at the termination of an SMS from the valid number which is stored in EEPROM is get display on the LED Board as shown in Figure 12.

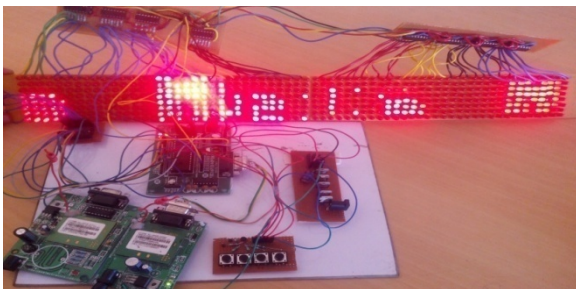


Figure 12. Message is Displayed on LED Board

## 6. CONCLUSION

This project has facilities to integrate GSM module with a moving LED display board thus making it really wireless. This system accepts the SMS, stores it, validates it and then displays it on the moving LED display module. The validation depends upon the stored numbers in EEPROM which are compared with the incoming number. The numbers stored in EEPROM can be edited by keypad provided separately. The key constraints included are the use of “#” as the end termination of the SMS. Multiple moving LED displays are connected via

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