Smartphone Controlled LED Scrolling Display Using Bluetooth

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Abstract- *This research paper explores the integration of smartphone technology with LED scrolling displays, offering a convenient and versatile means of controlling and interacting with such displays. The paper presents the design and implementation of a system where users can control the content displayed on the display .in this project LED scrolling display is manufactured and controlled using mobile app developed using MIT inventor which works on Bluetooth technology. Data to be displayed is sent serially via Bluetooth transmitter and thereby processed on the receiver and displayed on LED display.Successful findings indicate the potential of various technology for applications.*

Keywords- LED Scrolling display, smartphone control, Bluetooth, Arduino, IDE

I. INTRODUCTION

In conventional digital notice boards where one has to update the displayed information by manually changing the message using a keyboard or some other tool. But these notice boards can easily be converted into a wireless notice board, one such way is to use Bluetooth. By integrating Bluetooth, the information on the LED panel can be updated wirelessly through our smartphone. Here the HC05 Bluetooth module is connected to Arduino Uno which receives the data sent from the smartphone application. Then Arduino will process the data and display the information on the LED board.

LED displays are utilized in kind of applications, like store signs, billboards and lots of a lot of. In recent years it's ordinarily utilized in destination signs on conveyance vehicles. LED panels also are used for the aim of general illumination, task lighting and for stage lighting.

II. HARDWARE DESCRIPTION

Materials we used in design of hardware are:

A. Arduino Uno R3

Arduino Uno R3 is a popular microcontroller board based on the ATmega328P microcontroller. It features 114 digital input/output pins,6 analog inputs, a 16 MHz Quartz crystal, a USB connection for programming and power , a power jack, a ICSP header, and a reset button. The Uno R3 is compatible with a wide range of sensors, actuator, and shields, making it ideal for prototyping and DIY projects.


B.HC-05 Bluetooth Module
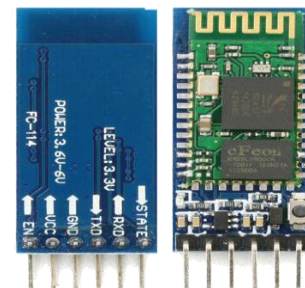
The HC-05 Bluetooth module is a popular choice for wireless communication in electronic projects. It operates on the Bluetooth 2.0 protocol and offers a range of up to 10 meters. . It uses the 2.45GHz frequency band. The transfer rate of the data can vary up to 1Mbps.The HC-05 module can be operated within 4-6V of power supply. The HC-05 is versatile and suitable for a wide range of applications such as robotics, home automation, and IOT devices**.**

C.P10 LED matrix

P10 is a 32*16 LED Matrix module which is popular for displaying big advertisements. There are 512 high-intensity LEDs in each unit of the P10 LED Module which consists, 32 LEDs in each row and 16 LEDs in each column. P10 LED modules can be multiplexed to build a bigger size display. There are two ports in a P10 module- input and output port. An input port is used for the incoming data from the Arduino side and the output port is used to connect the module to another LED P10 module.
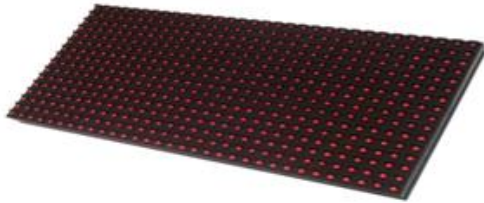
SOFTWARE DESCRIPTION

The supporting software we used in our projects are:

a)   Arduino IDE:

The Arduino IDE is an open-source software, which is used to write and upload code to the Arduino boards. The IDE application is suitable for different operating systems such as **Windows, Mac OS X, and Linux**. It supports the programming languages C and C++.

b) MIT App Inventor:

We have used the MIT App inventor to build build the Bluetooth application to control the message to be displayed.

III. PROPOSED SYSTEM
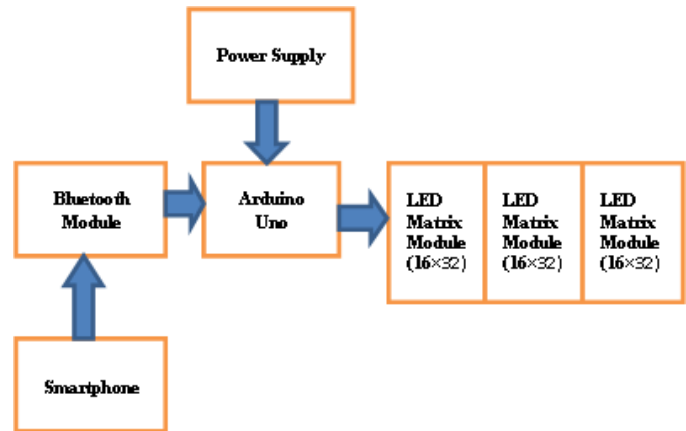
As shown in the figure above this is the system of LED Scrolling Display with wireless Bluetooth connectivity. This system consists of 3 P10 LED Matrix, Arduino Uno R3, Bluetooth Sensor and power supply. Here the whole system works on the inputs given via Bluetooth using app created by us. The system will respond as per text send via smartphone. Here the HC05 Bluetooth module is connected to Arduino Uno which receives the data sent from the smartphone application. Then Arduino will process the data and display the information on the LED board.

IV. RESULT

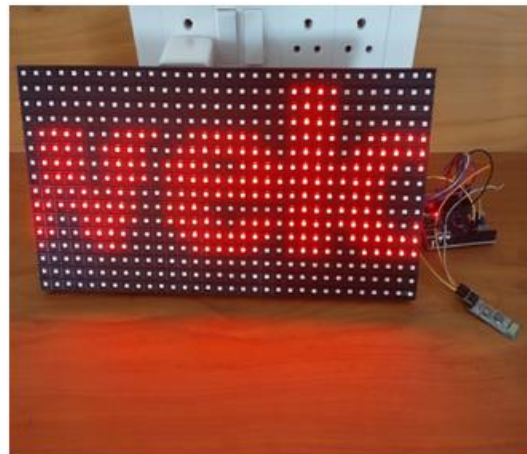1.   The Figure Shows the actual LED scrolling display using Bluetooth.

Fig. Actual LED Scrolling Display

b)Builded the app using the MIT app inventor.This App is used to control the notice to be displayed on the display.The app contains 'Send' and 'Clear' button to transmit the data.

Fig. Wireless Notice Board App

c)Running LED scrolling Display with complete Configuration:

App developed using MIT App inventor is installed on smartphone and all the required connections are made properly according to the block diagram and schematics. This App Controls the data which is to be displayed on LED Display.

After connecting HC-05 Bluetooth sensor the text to be displayed is written in the Text box and then transmitted by using the send Button and the information being displayed can be cleared using the Clear button.

Sometime the list of nearby Bluetooth is not available it's just because denied permissions of Bluetooth. Thus we have to enable all the permissions for Bluetooth and it works successfully as expected.

V. CONCLUSION

1. A Bluetooth based message display system was prudently designed and executed in this work.
2. The design shown to be effective and cost effective.
3. After successful implementation, messages sent from an android mobile phone via mobile application were received by the Bluetooth module and consequently, the messages were instantly displayed on the LED display.

VI. ACKNOWLEDGEMENT

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