LED MESSAGE SCROLLING DISPLAY

[1]Mr. Khilari V.S., [2]Ms.Jadhav Bhumika, [3]Mr.Devar Samarth

Lecturer, Department of Electronics & Telecommunication Engineering, SVSMD's KKI Polytechnic, Akkalkot, Maharashtra, India.[1]

Student, Department of Electronics & Telecommunication Engineering, SVSMD's KKI Polytechnic, Akkalkot, Maharashtra, India.[2]

vaijanathkhilari@gmail.com

ABSTRACT

LED Message Scrolling Display systems are widely used in public communication, advertising, educational institutes, transportation systems, and commercial applications. The proposed project titled "LED Message Scrolling Display" is developed to display scrolling messages using LED matrix displays and microcontroller technologies. The system is capable of displaying text messages, announcements, advertisements, emergency alerts, and public information in scrolling format. The system uses LED matrix modules, microcontrollers, communication interfaces, and programming techniques to control message display operations. The scrolling display system provides clear visibility, low power consumption, and efficient message communication. The implemented system combines hardware and software technologies to create a smart and cost-effective display solution for indoor and outdoor applications. The proposed system is reliable, user-friendly, flexible, and easy to operate.

INTRODUCTION

An LED Message Scrolling Display System: The LED scrolling display system is designed to display text messages in moving or scrolling format using LED matrix modules. The system acts as an electronic communication board capable of displaying information dynamically for public awareness and advertising purposes.

The LED display system consists of LED matrix modules, microcontrollers, power supply units, communication interfaces, and display control circuits. The microcontroller controls the LED matrix operation and continuously updates the scrolling messages according to programmed instructions.

The recent advancements in embedded systems and electronic display technologies have facilitated the development of LED display systems for railway stations, bus stands, hospitals, educational institutions, shopping malls, industries, and public places. LED scrolling displays help communicate information effectively and attract public attention.

The LED display system plays an important role in digital communication systems. The system allows users to display multiple messages, animations, symbols, and notices in real time. The scrolling mechanism improves readability and allows long messages to be displayed efficiently.

The LED scrolling display system is challenging because it requires synchronization of LED modules, display drivers, timing circuits, and communication systems. The display should provide smooth scrolling effects and maintain brightness consistency. Despite these challenges, modern microcontroller technologies have made LED display systems highly efficient and reliable.

LITERATURE SURVEY

LED display systems are widely used in communication, advertising, industrial automation, and transportation applications. Researchers have proposed different LED scrolling display systems capable of displaying text messages and animations effectively.

Some researchers developed LED scrolling displays using Arduino and microcontroller technologies for educational and commercial applications. These systems provide efficient message communication with low power consumption.

Other researchers proposed wireless LED display systems integrated with Bluetooth, Wi-Fi, and GSM technologies. These systems help users update scrolling messages remotely using smartphones and internet-based applications.

Researchers also developed LED matrix displays with animation control systems that communicate visual information effectively. The systems provide scrolling text effects, graphical displays, and dynamic content management.

Several LED display systems are developed using shift registers and display driver ICs to improve brightness control and scrolling speed. These systems help users display multiple messages efficiently.

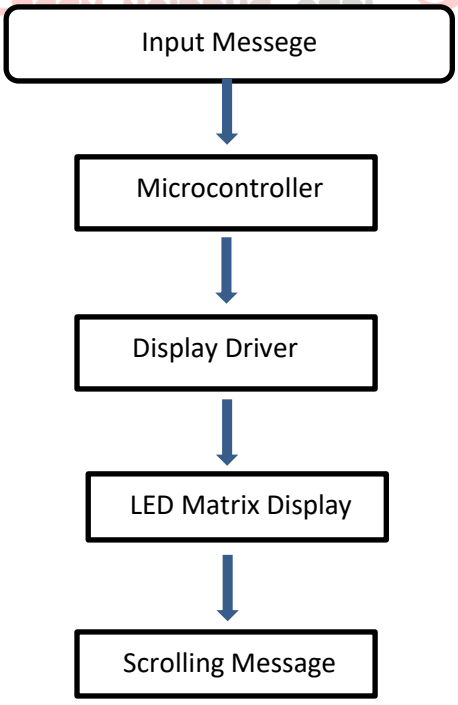
Embedded systems and communication technologies are increasingly used in LED display applications. Microcontrollers and wireless communication modules help the display system receive data and update scrolling messages automatically.

From the literature survey, it is observed that LED scrolling display systems are becoming important in communication and advertising applications. These systems provide smart information display solutions, reduce manual communication efforts, and improve information visibility.

IMPLEMENTATION & WORKING

The below figure shows the complete block diagram of the LED Message Scrolling Display System including components like LED matrix display, microcontroller, power supply, communication module, and control unit.

Block Diagram



The LED message scrolling display system works by controlling multiple LED matrix modules connected to the microcontroller. The microcontroller processes the input message and displays the scrolling text continuously. The input messages can be programmed manually or transmitted through wireless communication systems. The controller converts text characters into display patterns and sends data to the LED matrix display modules.

The display system can show:

- Public announcements
- Advertisement messages
- Emergency alerts
- Educational notices
- Railway and bus timings
- Welcome messages

The system continuously scrolls messages from one side of the display to another side.

METHODOLOGY

Communication and information display systems have become important in modern electronic applications. With the advancement of embedded systems and display technologies, LED scrolling displays are increasingly used in commercial and public communication systems. The LED Message Scrolling Display system is designed to display text messages dynamically using LED matrix modules.

The LED scrolling display system uses LED matrix modules, microcontrollers, display drivers, and communication modules to display scrolling text messages. The microcontroller stores predefined messages and controls the scrolling operation.

The display movement is controlled using programmed timing sequences. The controller continuously updates the LED matrix patterns to create scrolling effects. Communication modules may be used to update messages remotely.

Now the display starts showing scrolling messages according to predefined programming instructions. The LED display continuously scrolls text smoothly and provides high visibility.

Step 1 : The microcontroller initializes all LED matrix modules and display drivers.

Step 2 : Input messages are programmed or received through communication modules.

Step 3 : The controller converts text characters into binary display patterns.

Step 4 : The LED matrix modules display the text characters.

Step 5 : The scrolling mechanism shifts characters continuously across the display.

Step 6 : Brightness and scrolling speed are controlled automatically.

Step 7 : The display continuously updates messages and scrolling effects.

CONCLUSION & RESULT

This demonstrates that the LED Message Scrolling Display system is efficient, reliable, and user-friendly. The system can be used for public communication, advertising, educational applications, and transportation information systems.

The LED scrolling display successfully displays predefined messages and provides clear visibility. The system provides smooth scrolling effects and efficient communication performance.

By successful completion of this work, it was concluded that embedded systems and LED technologies can significantly improve electronic communication systems. LED scrolling displays can assist users in displaying information effectively without manual notice boards.

The system worked well in local environments and responded according to expectations. The implemented system uses LED matrix modules, display drivers, microcontrollers, and communication systems to create a smart display solution.

LED display technology can be further improved using wireless communication systems, cloud-based message control, mobile applications, and IoT technologies. The proposed system contributes toward the development of intelligent digital communication systems.

REFERENCES

1. K. Matsuse, Y. Kouno, H. Kawai, "Characteristics of Intelligent LED Display Systems", IEEE Trans. Electronic Applications, vol. 40, pp. 153-161, Jan./Feb. 2004.
2. H. Kubota, K. Matsuse, "Microcontroller Based LED Matrix Display Control Techniques", IEEE Trans. Embedded Systems, vol. 38, pp. 1566–1571, Nov./Dec. 2002.
3. S. Yokomizo, T. Nakano, "Display Driver Design for Scrolling LED Systems", IEEE Trans. Industrial Applications, vol. 30, pp. 1219–1224, Sept./Oct. 1994.
4. H. Kubota, K. Matsuse, "DSP Based LED Scrolling Display System", IEEE Electronics Journal, vol. 29, pp. 344-348, Mar./Apr. 1993.
5. Sidney R. Bowes, Ata Sevinc, Derrick Holliday, "New Intelligent LED Communication Display Applications Using Embedded Systems", IEEE Electronics and Communication Conference.