

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Electronic LED Scrolling Display Board

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ABSTRACT

Because of developments in technology, there have also been developments in terms of the ways that information can be shown for the sake of marketing and advertising. These developments have been made possible by those technological developments. These enhancements are a direct result of the technical developments that have taken place in recent years. LED matrix display boards are frequently used for the purpose of showing a variety of adverts and messages of varying lengths and formats. These Display boards have evolved into a regular fixture in several public spaces, including educational institutions, shop floors (workstations), and other public settings. Other public settings also frequently make use of these boards. They are utilized to display information such as the timetables for public transit platforms and times, in addition to displaying a variety of advertisements for items and important notices. Important notices and advertising are two examples of the additional forms of information that can be displayed on them. People are now accustomed to the concept that they can access any information in the world with only a few clicks of their mouse. This concept has revolutionized the way people acquire information.

Keywords: Wired display boards, Wi-fi, LED matrix display, Wireless technology,

Introduction

An Electronic LED Display Board is a type of digital sign that utilizes Light Emitting Diodes (LEDs) to display information, images, or videos. These displays are widely used in various applications, including advertising, public information systems, and as an interface for conveying real-time data. LED displays are highly visible, energy-efficient, and versatile, making them a popular choice for a wide range of industries. LED technology offers several advantages over traditional display technologies. The brightness, low power consumption, long lifespan, and ease of maintenance are key features that make electronic LED display boards ideal for both indoor and outdoor applications. These boards can display text, images, and video in high resolution, making them suitable for use in diverse environments, from busy city streets to retail stores and airports. the electronic LED display board aims to provide a solution that meets the needs for clear, concise, and dynamic communication. Whether used to display time-sensitive information, advertisements, or announcements, these boards offer a flexible platform for various forms of digital messaging. The project explores the technical aspects of designing and implementing an electronic LED display system, including the choice of components, circuit design, software integration, and control mechanisms. This will enable you to communicate and change your messages as frequently as is required. You can view the content remotely and bring these displays up to date in a very short amount of time. Using the internet, it is possible to exercise remote control over these systems.

Significance Of the System

Electronic LED scrolling display boards are significant because they offer a dynamic and versatile way to communicate information, advertising, and announcements. They are particularly effective in public spaces, retail environments, and transportation hubs, providing a cost-effective and attention-grabbing alternative to static signage. These boards can be easily programmed and updated remotely, ensuring that information remains current and relevant.

The scrolling nature of LED displays captures attention and keeps viewers engaged, making them more effective than static signage. They can display text, graphics, images, and even videos, allowing for a wide range of communication needs. The ability to update content remotely allows for immediate adjustments to messages, making them ideal for announcements, promotions, and emergency alerts. LED displays require minimal maintenance compared to traditional signage, reducing operational costs. They are designed for durability and longevity, providing a good return on investment.

Methodology

- A LED scrolling display that uses 64 LEDs to display alphabets and numbers. A cluster of red, Yellow and blue diodes is driven together to form a full-colour display. In a dot-matrix LED display, the LEDs are wired together in rows and columns to minimise the number of pins required to drive them
- Our project mainly consists of 5 major components: -
 - Power supply
 - o SMPS
 - o LED matrix display
 - LedArt app
 - o Driver
- This proposed system allows people to directly check the important information on the display. Here, we used the wireless Wi-Fi technology for communication. 230V AC power supply is given to the 5V SMPS device which converts AC into DC. SMPS gives power to the Driver and LED matrix display. Basically, Driver (ROHS HD-W00 V7. 0. 2) is a low cost, high cost-effective single color Wi-Fi controller device.
- Firstly, check the Wi-Fi is connected to the driver W00. Then, connect W00 to the LedArt app for text updating purpose. LedArt app is the software which is used for connecting Driver to the Wi-Fi. The system constantly transmits this data to the W00 controller, which now processes this data and keeps on transmitting it to the online web server over a Wi-Fi connection. The transmitted data is sent to the LED display and then it will print data on LED matrix display



Block Diagram



Hardware Description

1. P10 LED Display board

A P10 LED module is one of the most commonly used LED panels for scrolling message boards. The "P10" means the pixel pitch is 10mm (distance between two LEDs). A P10 LED module is a type of dot matrix display panel commonly used in outdoor and indoor scrolling display boards.



Fig 1. P10 LED Display Board

2. P10 RGB Display Controller

The P10 RGB Wi-Fi controller is commonly used in LED display boards, particularly for controlling large-scale LED signs or displays. This controller is designed to manage the color and brightness of RGB (Red, Green, Blue) LEDs, providing a full spectrum of color output.



fig 2. P10 RGB Display Controller

3. 5V DC SMPS

A 5V DC SMPS (Switched Mode Power Supply) is used to power LED scrolling display boards. It converts AC (110V/220V) to stable 5V DC required by the LED modules and control boards. It's preferred because it's compact, energy-efficient, and can handle high current needed for bright LED displays.



fig 3. 5V DC SMPS

4. P10 panel power cables

P10 panel power cables, commonly used with P10 LED display modules. These cables are crucial for powering the LED panels and typically connect from a power supply unit (PSU) to the individual LED panels.



Fig 4. P10 panel power cables

Future perspective

In future we can also use electronic led scrolling display board. The future of LED scrolling displays lies in increased interactivity, integration with other technologies like AI and IoT, and the development of more energy-efficient and sustainable solutions. They are poised to become even more versatile and impactful, finding applications in various industries and improving user experiences.

In the future, LED display scrolling screens will develop in the direction of higher definition, more functions, and more intelligence

Advantages

- 1. Dynamic Attention-Grabbing Motion :- Human vision is wired to notice movement, making these displays highly visible, even in busy environments.
- 2. Multiple Messages in One Board:- Unlike static boards, scrolling displays can cycle through multiple messages no need for extra space.
- 3. Customizable in Real-Time:-You can instantly update messages using an app, computer, or wireless connection, No need to reprint posters or change physical boards.
- 4. Remote Control Capability:- Many modern LED boards can be controlled via Wi-Fi, Bluetooth, or cloud, allowing remote updates
- High Visibility in All Lighting Conditions:- LED displays are super bright and visible in daylight or at night, They outperform printed boards in poor lighting or outdoor use.
- Cost-Effective Over Time:- No need to print new signs or hire someone to change a board, Reusable hardware just change the message digitally.

Conclusion

The prototype of the display that is based on WI-FI was designed in an efficient manner, which contributed to its overall success. This prototype already has all of the essential components built into it, and with the addition of a display board, it can be transformed into a real mobile/PC device. After recording the message or information, it checks to make sure that it is correct before eventually displaying it on the LED display once it has determined that it is correct. When the message is read from the EEPROM, it is instantly deleted, making room for the next message to be placed into the EEPROM's memory. There is only room for one SMS to be displayed at a time on the screen. These limitations can be overcome by employing microcontrollers with a higher end and increasing the amount of RAM that is available.

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