

CUSTOMIZABLE LED DISPLAY EDITOR USING ARDUINO

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ABSTRACT

Advertising has been a major tactic in the modern world industries. Among many of the ways used to advertise, using LED name boards has been a very popular advertising made in the past few decades. Current LED name boards are programmed with specific programmers and specific software. They are somewhat troublesome to edit. This study suggests a simple programmer with tiny Arduino Uno development board and a PS/2 keyboard. The proposed prototype is done with an LCD character display with the intention to extend the study to a LED name board. The specialty of the proposed prototype device is that the message displayed on the display can be interrupted and paused at any time and then the required new message to be displayed can be entered on the screen without the use of bulky PCs. After that the device can resume the display with displaying the newly entered message. Every time we enter a new message, the EEPROM of the Arduino Uno's microcontroller is modified.

Keywords: Electrically Erasable Programmable Read Only Memory (EEPROM), LED name boards, character LCD modifying simple system

1. INTRODUCTION

LED name boards are vastly used for advertising in present days. People have turned to LED name boards because the existing traditional advertising boards have some constraints with the advertising space, amount of the information conveyable at a single time using a single advertising board, uniformity of the messages displayed and etc. Therefore people tend to use LED name boards in advertising.

1.1 Existing Devices

The existing LED name boards are widely used to display a single set of messages. They are programmed for the first time and then established them in the required place to do the

required job. After that, the things displayed are could not be edited. That might be due to the unavailability of the programming software or the difficulty in reaching the places where the LED name board has been established. These commercially produced LED name boards come with a sealed container.

1.2 Significance of the Study

Nowadays super markets use LED name boards to display their products and the prices of them, passenger buses use LED name boards to convey their routes; their starting point and the destination with the cities via they reach the destination. The prices of the products might be changed regularly; the bus routes might be changed specially in CTB and private buses. Then those people have to frequently change the messages displayed. There may not be computers (PCs or laptops) at those places; they may not have the special software to programme. Then comes the importance of a simple portable programmer.

In this study, there are only a keyboard, Arduino Uno and a character LCD (for the prototype). Keyboard is there to interrupt the currently displaying message and to input the new message to be displayed, microcontroller in the Arduino Uno (AtMega 328) controls the displaying message and the EEPROM of the microcontroller^[1] (has 1KB memory⁽²⁾) stores the new text or alpha numeric input and the LCD is to display the messages.

2. EXPERIMENTAL

2.1 Block Diagram of the proposed Device

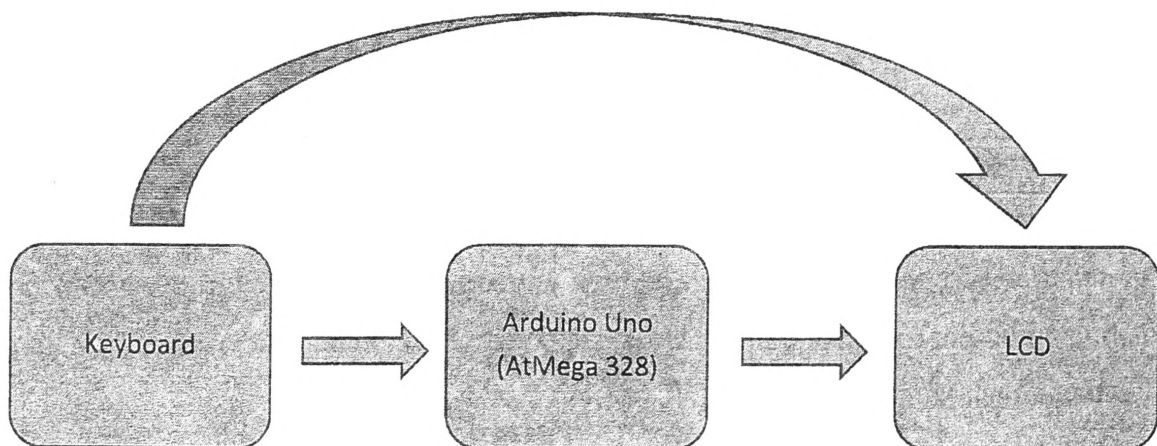


Figure1: Block diagram of the proposed device

The LCDs can display characters⁽³⁾. Here, the LCDdisplay does 2 types of things,

- i) The patterns with messages

ii) Instructions and the keyboard inputs

The EEPROM of the microcontroller is modified with the new message each time we enter a new message.

2.2 Functional Flow of the Device

At a time a certain message is displayed on the LCD, “Esc” key of the key board is pressed. At that time, the programme is set to an edit mode. There some instructions are given to:

- i) select a pattern to be displayed
- ii) enter the new message to be displayed

After entering the message, press “Shift+Enter” keys to save the new message to the EEPROM and restart the device. Then the new message is displayed in the selected pattern.

2.3 Hardware Platform and Programming

First, the Arduino Uno was interfaced with the LCD and then codes were written for some character display patterns. Codes for patterns were written using character wise operations. After that, a PS/2 keyboard was interfaced with the LCD through Arduino Uno and directly communicated with the LCD and given inputs were displayed. The microcontroller takes the new input message character wise. Then programme save the message in the EEPROM of the microcontroller. Now, the earlier values on the EEPROM are replaced with the new values. Then, after exiting from the edit mode, the new message is displayed as per the coding of the patterns.

3. RESULTS AND DISCUSSION

When a new message is entered according to the given instructions, the newly input message was started to display after saving the newly input message and restart the device.

Only few patterns were added.

This programmer is ideal for places such as super markets and buses where the messages have to be edited and changed regularly with low resources and within low time.

3.1 Further Development

Here, only the prototype was built. A simple programmer for the real situation can be built by making a LED display with LEDs connected each other with shift registers and current sinkers so that the each and every LED could be controlled separately. With the LCD screen

still there, the editing sequence can be monitored with it. For that, only have to interface the LED board with the Arduino Uno is sufficient.

4. CONCLUSION

The study suggests an ideal and a practical device to programme the LED name boards without facing much trouble. Advantages are; no need of bulky computers, no need of special software for programming. This device can be used in super markets, buses and other places where the editing of the LED name boards has to be done regularly.

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