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Scrolling Text Display on 8x8 LED Dot Matrix using NodeMCU

Pogula Sai Teja[1], Gandla Chandana[2], Dr. Ch. Subrahmanyam[3]
[1, 2]*U.G. Student,* [3]*Professor Dept. of ECE, Vardhaman College of Engineering, Hyderabad, Telangana-501218 India*

Abstract: ***Generally we use simple led regular static type display screen to deliver the message. Previously, to update the data either it may be large one it takes a long process to update data. Now a days scrolling type displays are more preferred over the static type displays. By adopting a programming device called NODEMCU, data can be displayed on dot matrix in scrolling manner. By adopting led 8x8 dot matrix using can controlled via IoT based system which controlled by mobile or laptop. Scrolling type text display boards, projects uses led dot matrix displays or regular outside purpose digital sign boards. The message scrolling displays are also type of scrolling LED display examples, presented here are nodemcu based led matrix display project. The led matrix is controlled using nodemcu by serial communication protocols. In this pair of 8*8 led Matrix display modules have used to display the transmitted message on Matrix display. nodemcu is heart of this project. The nodemcu is the transmitter to send data, and the receiver is led matrix display to display message on it.***
Keywords: NODEMCU, Dot matrix display, Android, WIFI, IoT, Message.

I. INTRODUCTION

Cars Cost effective and more productive type output have became most needed thing. This resulting using of more automatic control system things. Although proposed system gives different flexibility and inter communication, results the bugs. Hence robotization improves technology, system accepts human errors to minimize the impacts. By sticking it to the current situation the old methods of wired type the notice sticking by paper notice boards a person is needed to update the notice authority groups. Person who delivers message could sends it to the wrong group. As the electronics industry are flourishing faster problems can be solved by adapting simple solutions like digital based on the replacements equipment etc. Main theme of our project is to adapt Electronic type notice board so that to reduce the usage of paper in office, schools colleges, institutions etc. It reduces the percentage of errors by replacing led dot matrix or lcd displays with paper. In this project, displaying notices electronically by smarter way using smartphone or laptop. To update the information, the user who wants to update message can use the android phone or pc. To update information just login to website then write the message in update box next click on the update button to get it displayed on dot matrix module. The functionality can be used only if WIFI module is connected to hotspot or WIFI of the host. The hardware consists of an NODEMCU module that communicates to the WIFI module to receive messages then message can be displayed on dot matrix.

II. LITERATURE SURVEY

Some of the areas need urgent information or updates colleges our board must placed in RT, so we require dot matrix based displays. Our main motive is to update crucial information has to display on dot matrix and send it to NODEMCU. Received information is extracted in NODEMCU after getting permission information displays on dot matrix. Data updated on the board is called dot matrix display with no time limit. Current designs has there are many display drawbacks. In single dot matrix crucial information can be updated regardless of host. To eliminate the problems of old designs only particular display should be selected by that data can updated by microcontroller. The entities are recorded maintained for future use. The main controller has an internal a RTC used for matching data. The design contains sensor captures the data for the stipulated time period. Stored data sent to USB of controller and computer as a storage data base. The microcontroller interlinked to the notice board by WiFi controlled. The dot matrix display integrated with MAX7219 IC module. Required information transmitted from smart phone to GSM controller. The wifi modem is connected, through MAX 7219 Integrated Circuit. The information can stored in EEPROM and dot matrix display. By adopting this scrolling led dot matrix displays they are not effective in any needs. Even this display board can't be placed anywhere because they are complex and more delicate wiring in nature. NODEMCU based LED Dot Matrix Scrolling Display Board is a model for updating notices or messages to display within any networked area. Our motive is to relate communication service with led dot matrix displays integrated with MAX7219 IC remotely using nodemcu and to update message instantly on the display board. The admin can update message even he is at distant place remotely with simple UI.

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III. WORKING

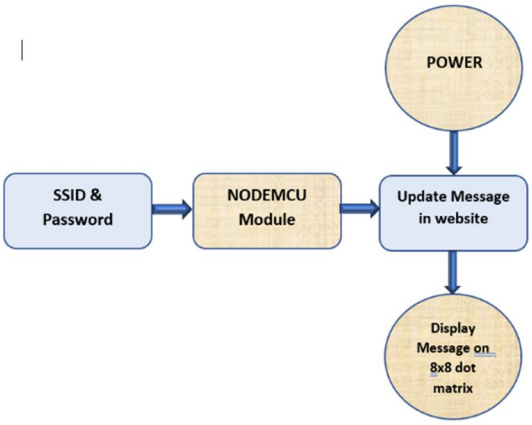


Fig.1 System Block Diagram

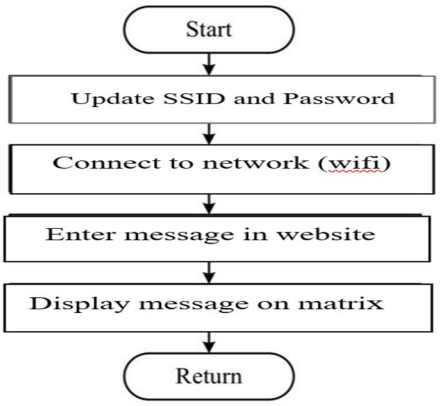


Fig.2 Flow chart

1) *Block Diagram:* The block diagram is shown in Fig. 2 where it depicts all the equipment which are connected to each other. Firstly, the SSID, Password enter in nodemcu along with API key nodemcu module connected to wifi or personal hotspot next in the website after successfully login with credentials enter the message want to update agter writing message in dialogue box click on update it will updated and message will be displayed on 8x8 dot matrix module whole system requires DC 5V power supply.
2) *Flowchart:* It is the process of interaction between the external entities as well as system. This system broadly classifies the functionality of the system into components that perform the actions. Connecting to network, display IP address, enter the text, fetch the input and display it on matrix. Connecting to the net is common action performed by website and dot matrix. Display message, take input and display the text will be performed by dot matrix. Enter the text will be performed by website through mobile.In the flow chart diagram first we will update the SSID and password of the wifi ,then we will check whether connection is established or not. If established we will then enter the API Key in website after logging with credentials and then we will type the text on dialogue box and next click on update box which has to be displayed on the led dot matrix module. If connection is not established then we willgo back to check whether SSID and password are correct or not.

IV. SYSTEM MODULE DESCRIPTION

In ciruit connection part we have mainly used three components they are nodemcu, 8x8 dot matrix display, android mobile and some jumpers for connections. After making connections open Arduino IDE software it is the software used to dump the code into nodemcu but it not as simple not we can easily dump the code in nodemcu.. Firstly in IDE software go to libraries section then search for max7219pannel.h library next download libraries from the installer it has three stages link of max7219pannel.h libraries should be copy and paste in three level section then max library will be downloaded now first library has downloaded this max7219pannel.h library will be used to display the characters on dot matrix display. Next to save the data cloud should be present means we have to install a library called adafruit.gfx.h library from github open source platform or from library installer in IDE software.

Next to make connection with mobile and nodemcu wifi.h library should be present so from IDE library installer or open source github esp8266wifi.h library should be downloaded. Next for serial communication purpose spi.h library should be present so this spi.h library must be downloaded from github or IDE software. To scroll the text on dot matrix parola.h library should be added. For every library there is reason behind it each library performs own function. After downloading all the libraries from open source platforms or IDE Arduino software now we have to add by zip format in add libraries section from Arduino IDE software. The installation process and script code writing part will be clearly discussed in software tools chapter. Now after adding all code with attached libraries from Arduino IDE software make connections from dot matrix display and nodemcu with jumpers.

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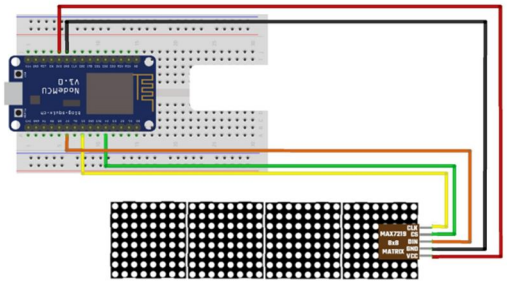


Fig.3 circuit description

Data pin D7 from Node MCU is connected to the display pin Din. Data pin D4 from Node MCU is connected to the display pin CS, Data pin D5 from Node MCU is connected to the display pin CLK. VCC pin from Node MCU connected to VCC pin in display. GND pin from Arduino connected to GND pin in display. Using data output pin in display we can connect to another display in serial as Shown. In above Figure. It has inbuilt Wifi module, its is used for communication purpose.

1) *NODEMCU:* The most famous IoT platform is Node MCU. Node MCU firmware works on ESP8266 WiFi Systems. The controller of Node MCU uses the Lua scripting language. Node MCU ESP8266 module has Non-OS SDK. It is open platform where the hardware can easily designed and easily editable modifications of project are also not complex. Node MCU comes with series called ESP8266 where inbuilt WiFi already enabled. It is a low-cost module with TCP/IP protocols. Node MCU board generally in black color pcb board. . It provides unsurpassed ability to embed WiFi capabilities within other systems, or to function as a standalone application, with the lowest cost, and minimal space requirement.

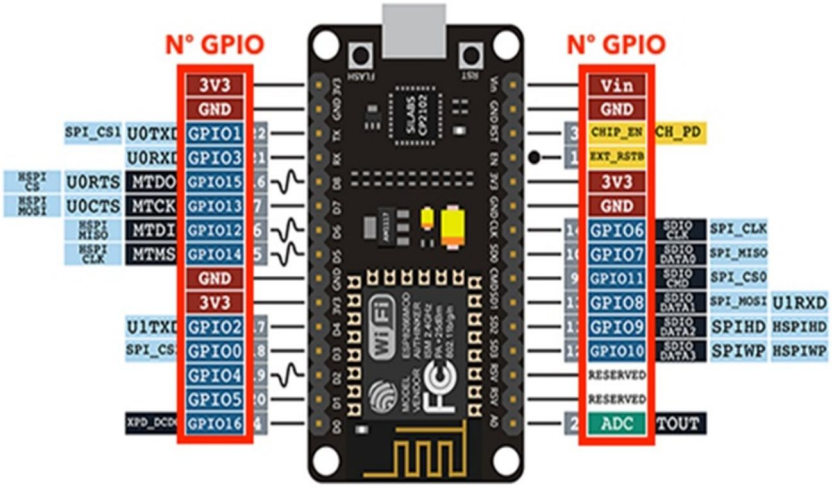


Fig.4 NODEMCU Board

V. ARDUINO IDE

Development cycle of Arduino IDE has divided into 4 phases:



Compile: Compile means to translate the sketch into machine language, also known as object code
Run: Arduino sketch is executed as soon as terminates the step of uploading on the board

Figure5: development cycle phases

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The below screenshots gives the idea about this project after execution in stage to stage levels each proposed protocol for different values.

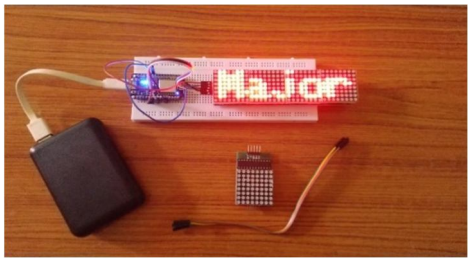


Figure8: Output Result.

VI. FUTURE SCOPE

Everything evolving in smarter way like mobiles, TVs, home assistants etc. Smart boards evolving as first requirement everywhere. Now people are adapting the idea of the world. Previously old wired display boards are controlled by 8051 microcontroller. When we want to update message we need program code to change again and again. By adding GSM to the interface of wireless communication, drawbacks can be solved. We can say it as a starting era of smart and RT displays being updating messages on display boards.

VII. CONCLUSION

Generally we use simple led regular static type display screen to deliver the message. Previously, to update the data either it may be large one it takes a long process to update data. Now a days scrolling type displays are more preferred over the static type displays. By adopting a programming device called NODEMCU, data can be displayed on dot matrix in scrolling manner. By adopting led 8x8 dot matrix using can controlled via IoT based system which controlled by mobile or laptop. Scrolling type text display boards, projects uses led dot matrix displays or regular outside purpose digital sign boards. The message scrolling displays are also type of scrolling LED display examples, presented here are nodemcu based led matrix display project. The led matrix is controlled using nodemcu by serial communication protocols. In this pair of 8*8 led Matrix display modules have used to display the transmitted message on Matrix display. nodemcu is heart of this project. The nodemcu is the transmitter to send data, and the receiver is led matrix display to display message on it.

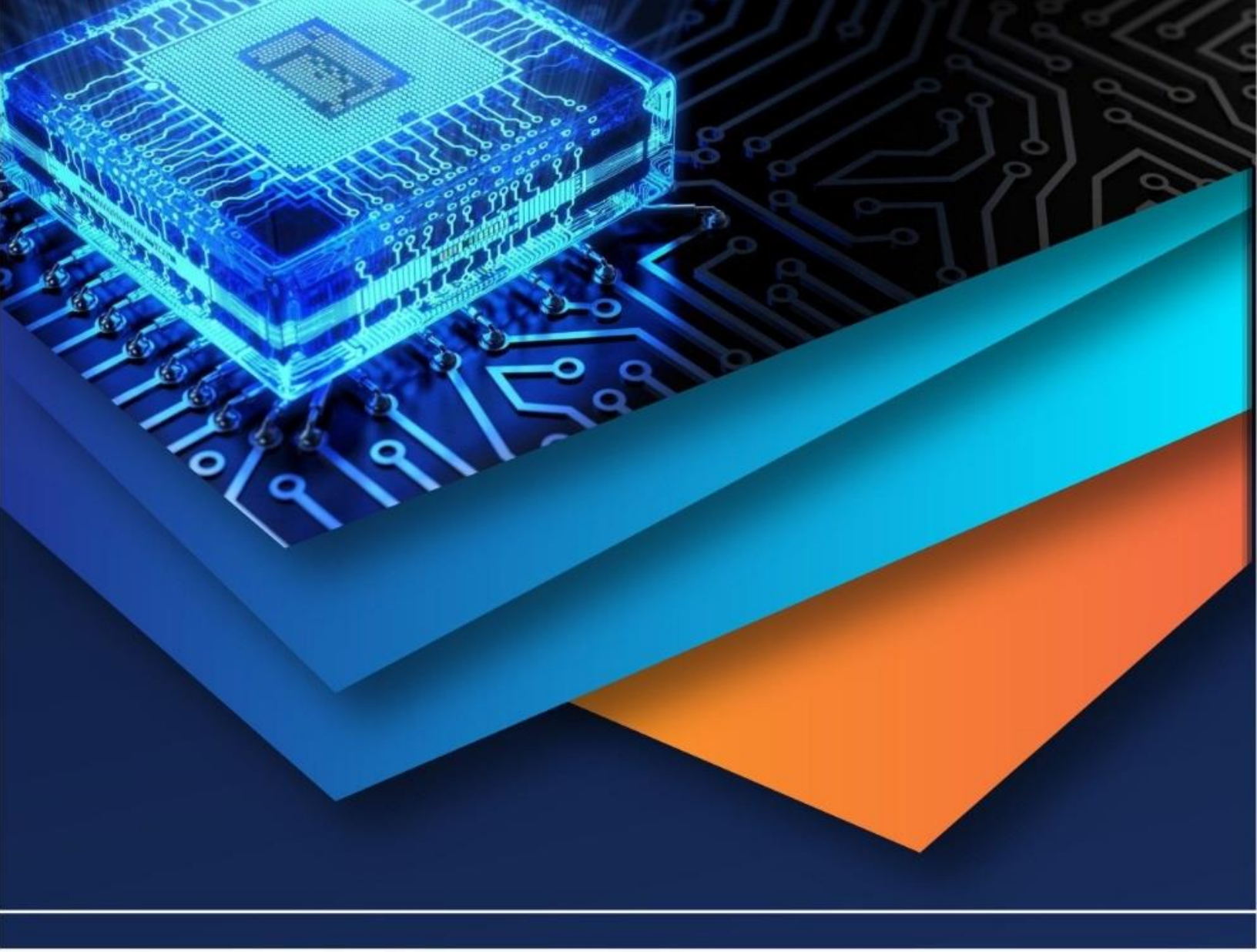
VIII. ACKNOWLEDGEMENT

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