

# CUSTOMIZED DISPLAY BOARD

## PROJECT DESCRIPTION

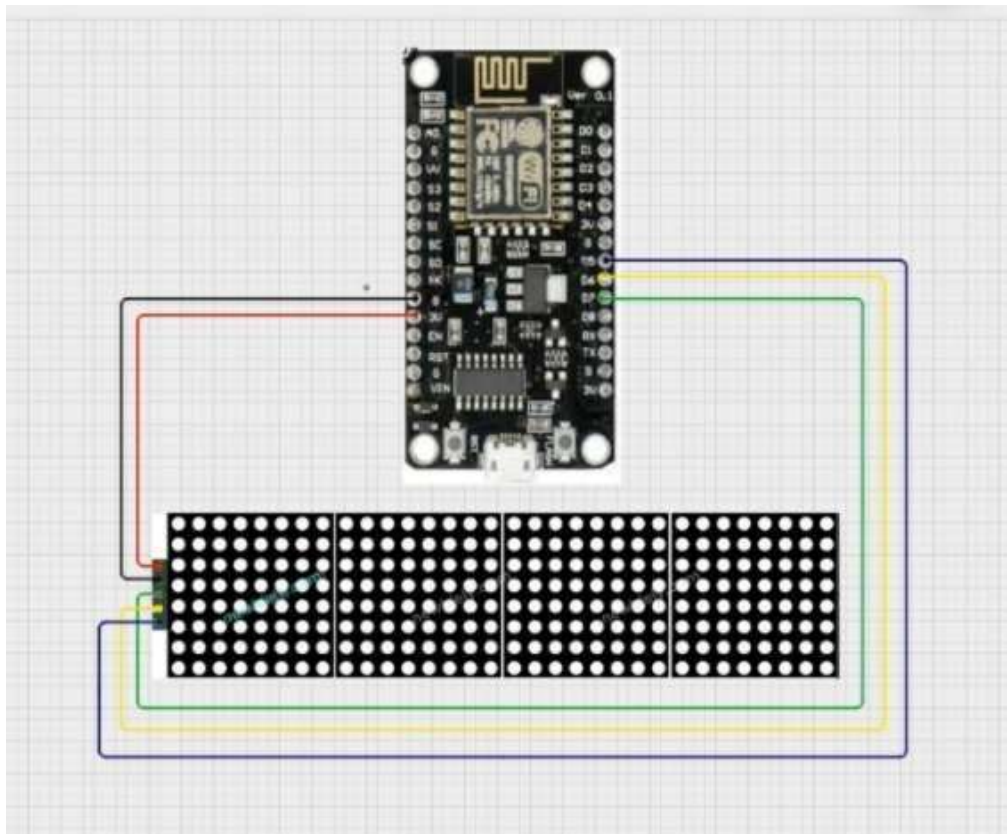
This project is a **Wi-Fi controlled scrolling LED message board** using an **ESP8266 (NodeMCU)** and a **MAX7219 8×8 LED matrix (4-in-1)** display. The ESP8266 acts as a **Wi-Fi server**. Any user connected to the same Wi-Fi network can open a webpage, enter a message, and instantly display it as a **scrolling text** on the LED matrix. It is ideal for **notice boards, colleges, shops, bus stands, classrooms, and event displays**.

## PIN CONNECTIONS

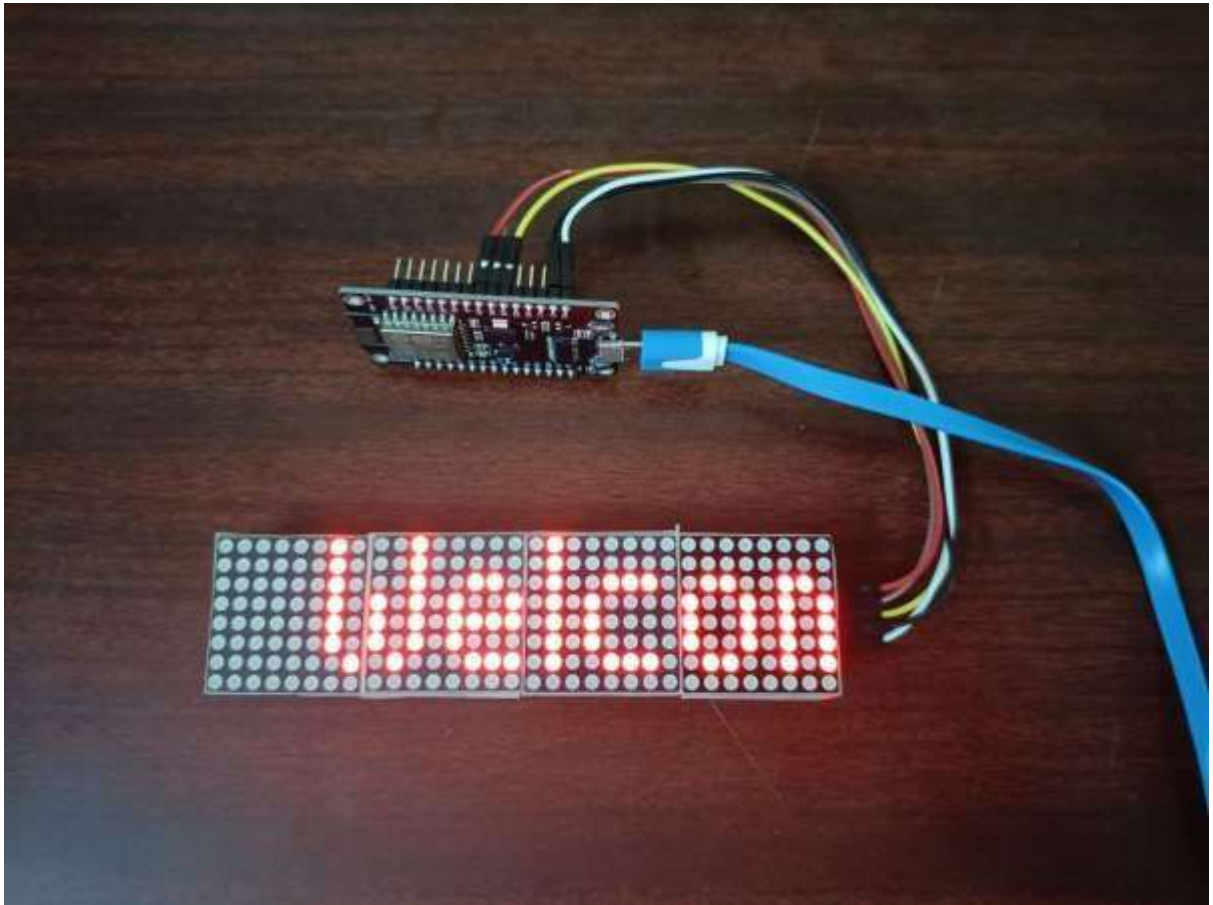
### ESP8266 (NodeMCU) ↔ MAX7219 LED Matrix

MAX7219 Pin	ESP8266 Pin
VCC	5V / VIN
GND	GND
DIN	D7 (GPIO13)
CLK	D5 (GPIO14)
CS / LOAD	D6 (GPIO12)

## CIRCUIT DIAGRAM



## PROJECT PHOTOS



## PROCEDURE

1. Power ON the ESP8266 display system.
2. ESP8266 connects to the mobile hotspot named "ESP DISPLAY" (Password: 12345678).
3. Mobile or laptop is connected to the same hotspot.
4. Open a web browser and enter the ESP8266 IP address - "10.115.83.53"
5. A web page opens to enter the display text.
6. Type the required message and submit.
7. The message is displayed on the MAX7219 LED matrix.
8. The display can be updated anytime through the web page.

## CODE

```
#include <ESP8266WiFi.h>
#include <MD_Parola.h>
#include <MD_MAX72xx.h>
#include <SPI.h>

// ----- LED Matrix Settings -----
#define HARDWARE_TYPE MD_MAX72XX::FC16_HW
#define MAX_DEVICES 4 // 4-in-1 Display
#define CLK_PIN D5 // SCK
#define DATA_PIN D7 // MOSI
#define CS_PIN D6 // CS

MD_Parola Display = MD_Parola(HARDWARE_TYPE, CS_PIN, MAX_DEVICES);

// ----- WiFi Settings -----
const char* ssid = "ESP_DISPLAY";
const char* password = "12345678";

WiFiServer server(80);
```

```

String message = "Welcome";

// -----

void setup() {
  Serial.begin(115200);

  // Initialize display
  Display.begin();
  Display.setIntensity(5);    // Brightness 0-15
  Display.displayClear();
  Display.displayScroll(message.c_str(), PA_CENTER, PA_SCROLL_LEFT, 50);

  // Connect to WiFi
  Serial.println("Connecting to WiFi...");
  WiFi.begin(ssid, password);

  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }

  Serial.println("\nWiFi Connected!");
  Serial.print("IP Address: ");
  Serial.println(WiFi.localIP());

  server.begin();
}

// -----

void loop() {
  Display.displayAnimate();

  WiFiClient client = server.available();
  if (!client) return;

  while (!client.available()) delay(1);

  String req = client.readStringUntil('\r');
  client.flush();

  if (req.indexOf("text=") != -1) {
    message = req.substring(req.indexOf("text=") + 5);
    message.replace("+", " ");
    message.replace("%20", " ");
  }
}

```

```

Serial.println("New Message: " + message);

Display.displayClear();
Display.displayScroll(message.c_str(), PA_CENTER, PA_SCROLL_LEFT, 50);
}

// Webpage HTML
String webpage =
  "<html><head><title>LED Message Board</title></head>"
  "<body style='text-align:center;font-family:Arial;'>"
  "<h2>MAX7219 LED Display</h2>"
  "<form action='/' method='GET'>"
  "<input type='text' name='text' style='width:250px;height:30px;font-size:18px;'>"
  "<br><br>"
  "<input type='submit' value='Display' style='font-size:20px;padding:10px;'>"
  "</form>"
  "</body></html>";

client.print("HTTP/1.1 200 OK\r\nContent-Type: text/html\r\n\r\n");
client.print(webpage);
client.stop();
}

```