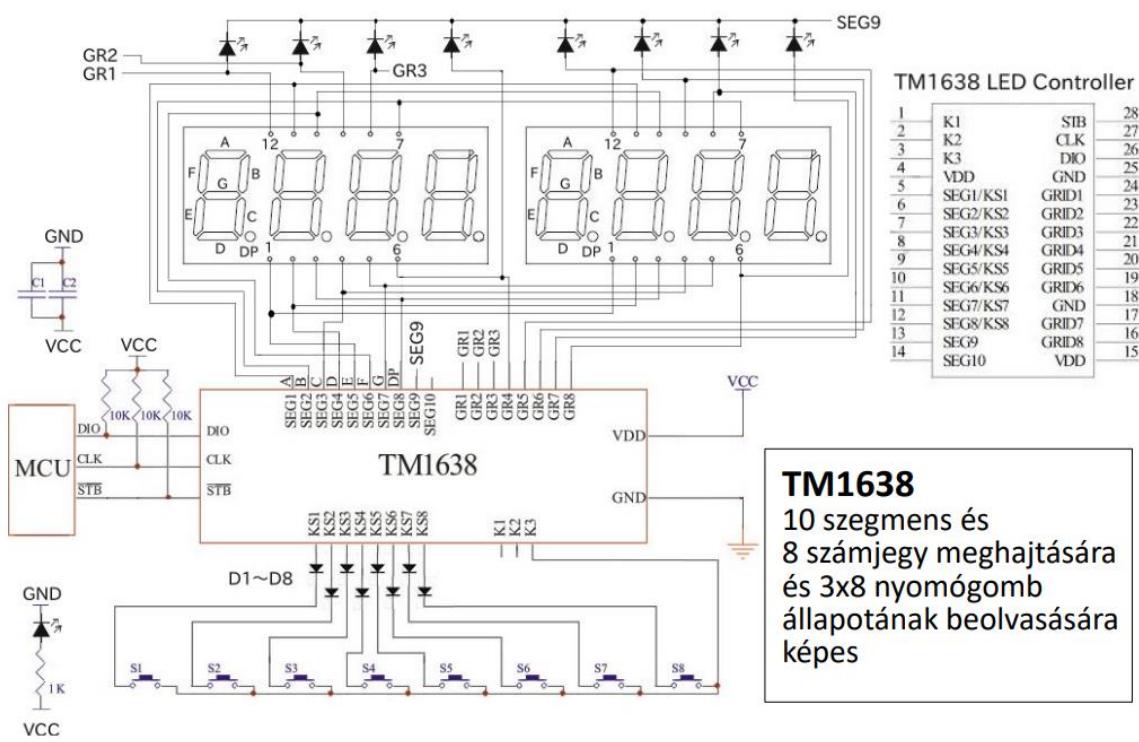
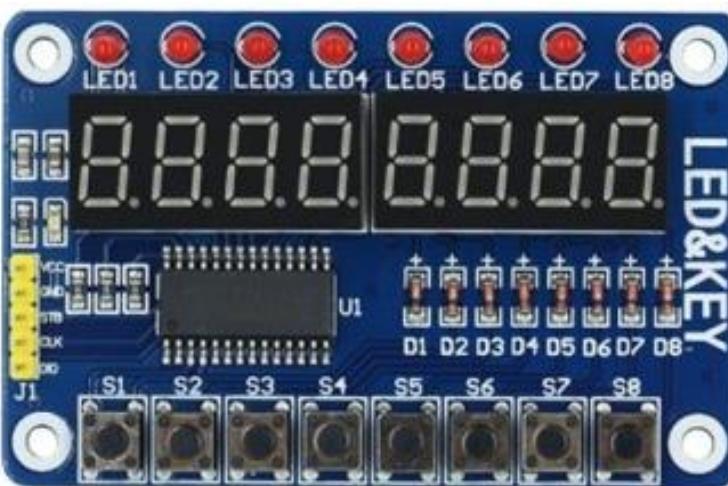


## Getting Start ESP32: ESP32 GPIO + ESP32 Interface

### Mission 5/12 – ESP32 + TM1638 7Segment Display Keypad & LED

1. 8-Digit 7 Segment Display with 8 LED and 8 Push Switches TM1638 BOARD
2. Read <https://www.cybertice.com/p/1350>
3. Read <https://www.allnewstep.com/p/1157>
4. Read [https://megtestesules.info/hobbielektronika/2023/h2023\\_10.pdf](https://megtestesules.info/hobbielektronika/2023/h2023_10.pdf)



5. Add Library: Sketch → Include Library → Manage
6. Filter with “tm1638plus”, Select TM1638plus by Gavin Lyons Version 1.9.0

The screenshot shows the Arduino IDE Library Manager interface. At the top, there's a toolbar with icons for file operations like Open, Save, and Print. Below the toolbar is a menu bar with File, Edit, Sketch, Tools, Help, and a "Select Board" dropdown.

The main area is divided into two sections: "LIBRARY MANAGER" on the left and "sketch\_dec25a.ino" on the right.

**LIBRARY MANAGER:**

- Search bar: Type: All, Topic: All
- Library list: TM1638plus by Gavin Lyons <glyons66@hotmail.com>
- Details for TM1638plus:
  - Version: 1.9.0 installed
  - Description: TM1638plus is an Arduino library to control TM1638 seven segment modules. It supports push buttons, LEDs and the decimal point LED features of these modules. Can display ASCII, Decimal, Hexadecimal and text strings. Small Memory footprint.
  - More info link
- Buttons: "1.9.0" (selected), "REMOVE"

**sketch\_dec25a.ino:**

```

1 void setup() {
2   // put your setup code here, to run once:
3
4 }
5
6 void loop() {
7   // put your main code here, to run repeatedly:
8
9 }
10

```

**Output:**

```

Downloading TM1638plus@1.9.0
TM1638plus@1.9.0
Installing TM1638plus@1.9.0
Installed TM1638plus@1.9.0

```

**Library Manager:**

Type: All, Topic: All, Search term: tm1638plus

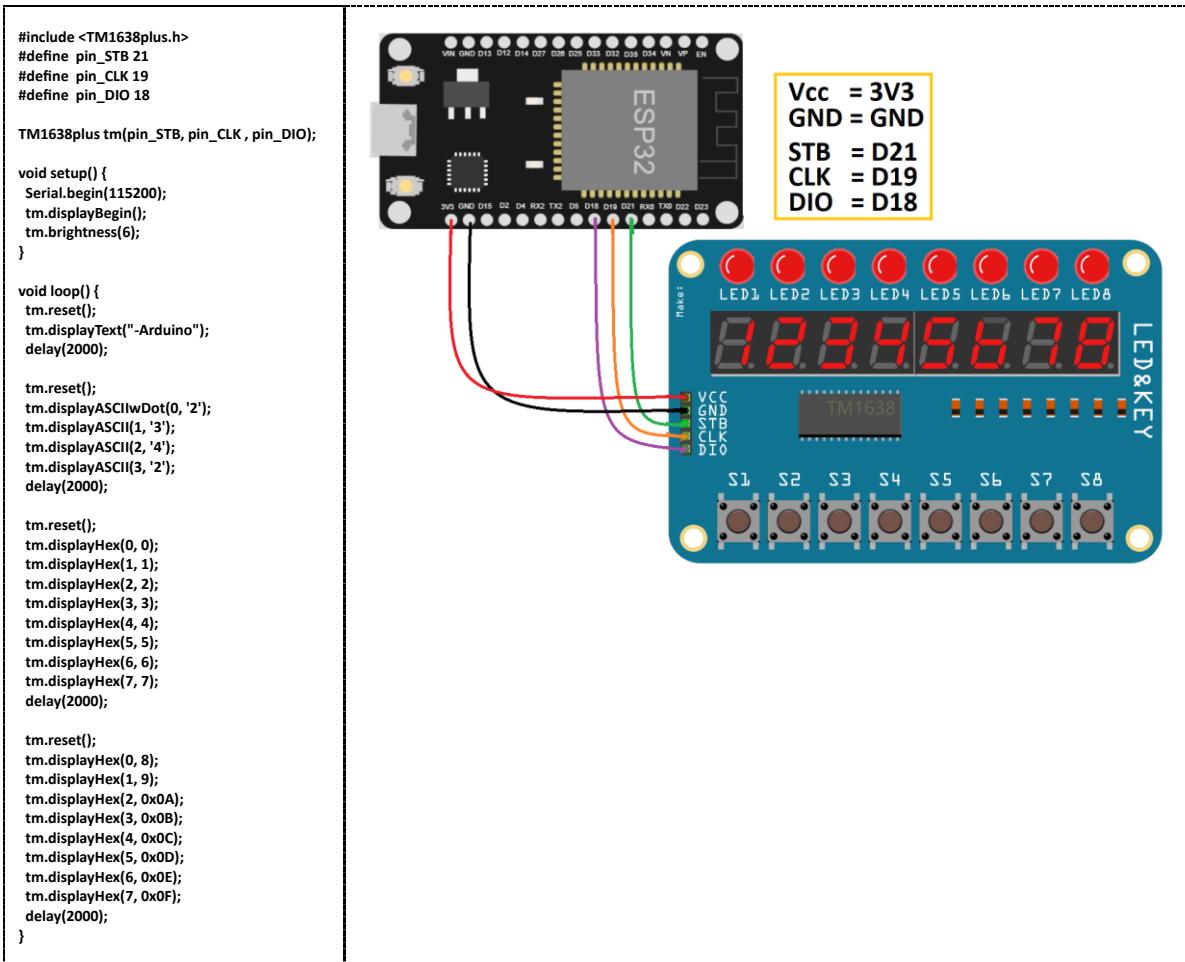
Results for TM1638plus:

- TM1638plus by Gavin Lyons Version 1.9.0 INSTALLED
  - Description: TM1638plus is an Arduino library to control TM1638 seven segment modules. It supports push buttons, LEDs and the decimal point LED features of these modules. Can display ASCII, Decimal, Hexadecimal and text strings. Small Memory footprint.
  - More info link
  - Select version dropdown
  - Install button
  - Update button

**Bottom Panel:**

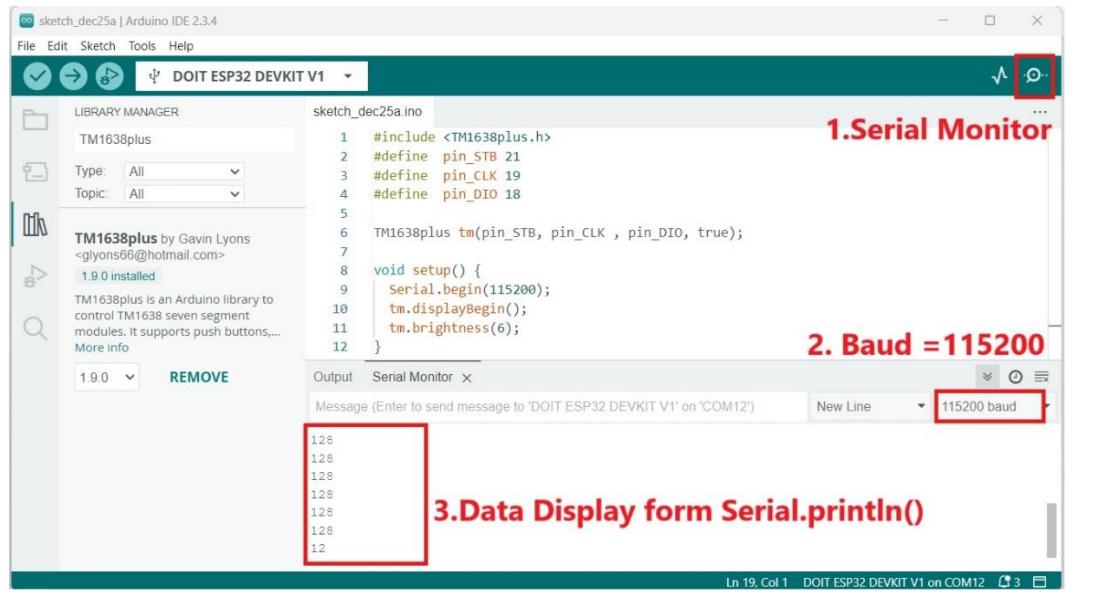
TM1638plus by Gavin Lyons Version 1.9.0

## 7. Test Code 1 “Test01-Hello TM1638”



## 8. Test Code 2 “Test02-Switch on Board”

<pre>#include &lt;TM1638plus.h&gt; #define pin_STB 21 #define pin_CLK 19 #define pin_DIO 18  TM1638plus tm(pin_STB, pin_CLK, pin_DIO, true);  void setup() {   Serial.begin(115200);   tm.displayBegin();   tm.brightness(6); }  void loop() {   uint8_t buttons = tm.readButtons();   Serial.println(buttons);   delay(250); }</pre>	<ul style="list-style-type: none"> <li>- แสดงผลการทำงานที่ Serial Monitor</li> </ul>
---	--



**1.Serial Monitor**

**2. Baud =115200**

**3.Data Display form Serial.println()**

## 9. Test Code 3 “Test03-LED on Board”

<pre>#include &lt;TM1638plus.h&gt; #define pin_STB 21 #define pin_CLK 19 #define pin_DIO 18  TM1638plus tm(pin_STB, pin_CLK, pin_DIO, true);  void setup() {   Serial.begin(115200);   tm.displayBegin();   tm.brightness(6); }  void loop() {   uint8_t buttons = tm.readButtons();   Serial.println(buttons);   tm.reset();   tm.displayText("-----");   tm.setLED(0, ((buttons &gt;&gt; 0) &amp; 1));   tm.setLED(1, ((buttons &gt;&gt; 1) &amp; 1));   tm.setLED(2, ((buttons &gt;&gt; 2) &amp; 1));   tm.setLED(3, ((buttons &gt;&gt; 3) &amp; 1));   tm.setLED(4, ((buttons &gt;&gt; 4) &amp; 1));   tm.setLED(5, ((buttons &gt;&gt; 5) &amp; 1));   tm.setLED(6, ((buttons &gt;&gt; 6) &amp; 1));   tm.setLED(7, ((buttons &gt;&gt; 7) &amp; 1));   delay(250); }</pre>	<ul style="list-style-type: none"> <li>- &gt;&gt; คือ Shift Right</li> <li>- &amp; คือ bit and</li> <li>- สมมติ button = asdf ghij = 11011111       <ul style="list-style-type: none"> <li># (buttons &gt;&gt; 7) &amp; 1 จะได้ a = 1</li> <li># (buttons &gt;&gt; 6) &amp; 1 จะได้ s = 1</li> <li># (buttons &gt;&gt; 5) &amp; 1 จะได้ d = 0</li> <li># (buttons &gt;&gt; 4) &amp; 1 จะได้ f = 1</li> <li># (buttons &gt;&gt; 3) &amp; 1 จะได้ g = 1</li> <li># (buttons &gt;&gt; 2) &amp; 1 จะได้ h = 1</li> <li># (buttons &gt;&gt; 1) &amp; 1 จะได้ i = 1</li> <li># (buttons &gt;&gt; 0) &amp; 1 จะได้ j = 1</li> </ul> </li> </ul>
--	--

## 10. Test Code 4 “Test04-Switch, LED and Display”

```
#include <TM1638plus.h>
#define pin_STB 21
#define pin_CLK 19
#define pin_DIO 18

TM1638plus tm(pin_STB, pin_CLK, pin_DIO, true);

void setup() {
  Serial.begin(115200);
  tm.displayBegin();
  tm.brightness(6);
}

void loop() {
  uint8_t buttons = tm.readButtons();
  Serial.println(buttons);
  tm.reset();
  tm.displayText("-----");
  for (int i = 0; i < 8; i++) {
    bool DataBit = (buttons >> i) & 1;
    tm.setLED(i, DataBit);
    if (DataBit) tm.displayHex(i, i);
  }
  delay(250);
}
```

## 11. Test Code 5 “Test05-Switch Counter”

```
#include <TM1638plus.h>
#define DebounceDelay 100
#define Counter_Switch 0 // D0 or BOOT
#define pin_STB 21
#define pin_CLK 19
#define pin_DIO 18

int nCounter = 1234;
TM1638plus tm(pin_STB, pin_CLK, pin_DIO);

void TM1638_Display(int Tempp) {
  int singleDigit;
  tm.reset();
  singleDigit = Tempp % 10; Tempp /= 10; tm.displayHex(7, singleDigit);
  singleDigit = Tempp % 10; Tempp /= 10; tm.displayHex(6, singleDigit);
  singleDigit = Tempp % 10; Tempp /= 10; tm.displayHex(5, singleDigit);
  singleDigit = Tempp % 10; Tempp /= 10; tm.displayHex(4, singleDigit);

  tm.displayASCII(0, 'C');
  tm.displayASCII(1, 'n');
  tm.displayASCIIDot(2, 't');
  tm.display7Seg(3, 0b01001000); //tgef dcba
}

void setup() {
  pinMode(Counter_Switch, INPUT_PULLUP);
  Serial.begin(115200);
  tm.displayBegin();
  tm.brightness(6);
  Serial.begin(115200);
  TM1638_Display(nCounter);
}

void loop()
{ if (digitalRead(Counter_Switch) == LOW) { // If Switch Press
  delay(DebounceDelay); // Debounce Delay H->L
  while (digitalRead(Counter_Switch) == LOW); // wait until release
  delay(DebounceDelay); // Debounce Delay L->H
  nCounter++;
  Serial.println(nCounter);
  TM1638_Display(nCounter);
}
}
```

- กดปุ่ม BOOT จะนับจำนวนขึ้น +1
- How are the following commands different?
  - tm.displayASCII(0, 'C');
  - tm.displayASCIIDot(2, 't');
  - tm.displayHex(4, singleDigit);
  - tm.display7Seg(3, 0b01001000); //tgef dcba