7 Segment 4-Digit Display Module (Technical Note)

Introduction

A seven-segment display is a form of electronic display device for displaying decimal numerals that is an alternative to the more complex dot matrix LED.

Seven-segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information.

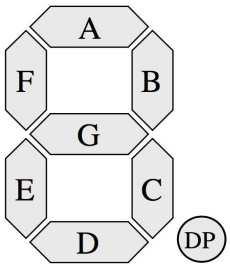
Scientific Fact and Applications

These modules have a display controller chip that can be programmed to turn on any combination of lighted elements in each 7 segment unit. The display command and data are serially transmitted from an Arduino to the module using Clock (CLK) and Data IO (DIO) pins on the module.

These devices are available in LED colors such as white, blue, red, yellow and green (red is commonly used). It is a low current operated device. Individual segment operates as a separate part and can be lit when the connections are made. Thus, a programmed logic is necessary to display any meaningful content of numerals. The 'TM1637Display' library offers easy functions to use this module.

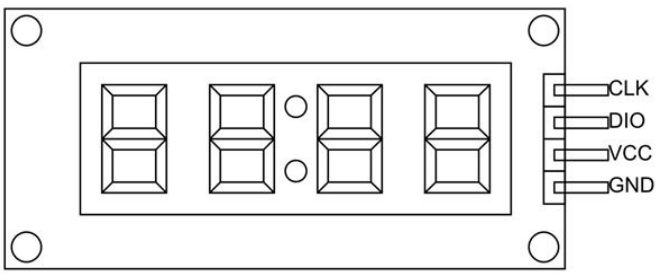
Applications:

- Digital Clocks
- Basic Calculators

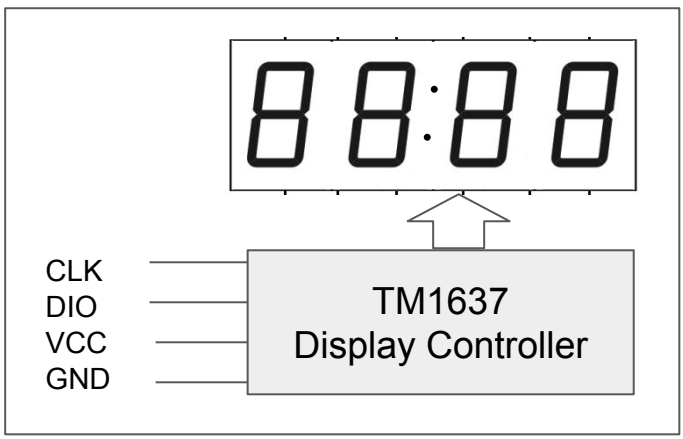


LED segment Identification

Pin Connection



Block Diagram of Display Module



Z2M Part Number:
EMA-00007-A

7 Segment 4-Digit Display Module (Application Note)

Project

Display number counter from 1 to 100 and then display example temperature.

Components Required

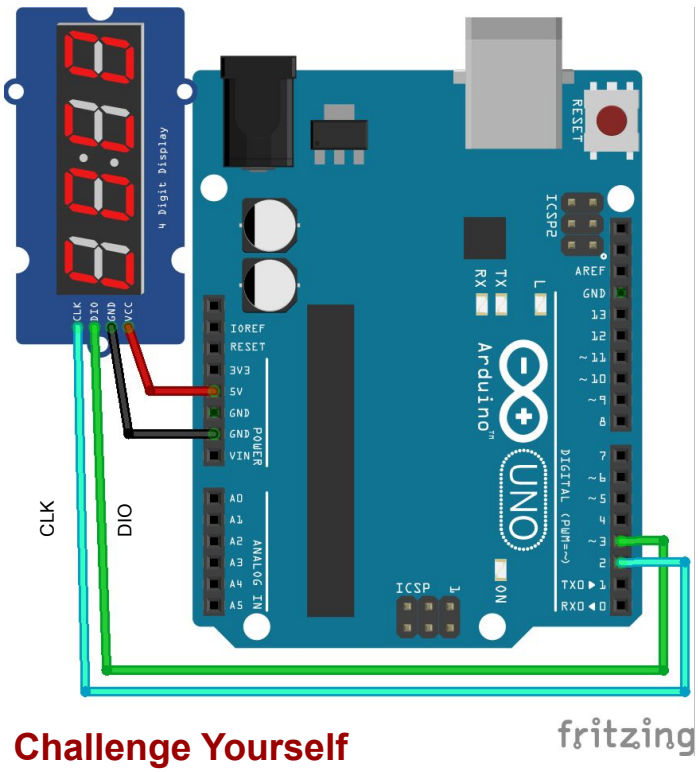
Component	Part No.	Qty
Arduino UNO	EMX-00001-A	1
7 Segment Display, 4 digit module	EMA-00007-A	1

Procedure

7 Segment 4 digit display

- Connect **VCC** pin of module to **5V** of Arduino
- Connect **GND** pin of module to **GND** of Arduino
- Connect **DIO** pin of module to **3** pin of Arduino
- Connect **CLK** pin of module to **2** pin of Arduino
- Find and install the required libraries (h files) from https://tinyurl.com/Z2MLibraries.

Schematic



Challenge Yourself

1. Connect the TM1637 display to a temperature sensor to create a digital thermometer.

Code

```
/* Include the library:*/
#include <TM1637Display.h>
/* Define the connections pins:*/
#define CLK 2
#define DIO 3
/* Create display object of type TM1637Display:*/
TM1637Display display = TM1637Display(CLK,
DIO);

/* Create degree Celsius symbol:*/
const uint8_t celsius[] =
{
  SEG_A | SEG_B | SEG_F | SEG_G,  /* Circle*/
  SEG_A | SEG_D | SEG_E | SEG_F   /* C*/
};

void setup() /* Clear the display:*/
{
    display.clear();
  delay(1000);
}

void loop() /* Set the brightness 0-7*/
{
    display.setBrightness(4);
  /* Show counter:*/
  int i;
  for (i = 0; i < 101; i++)
  {
    display.showNumberDec(i);
    delay(50);
  }
  delay(1000);
  display.clear();

  /* Display temperature as example*/
  int temperature = 24;
/* display.showNumberDec(arg_1, arg_2, arg_3,
arg_4)
   arg_1 -> Number of type integer. Values up
to 9999.
   arg_2 -> True/false. Display leading zeroes
for values up to 999. Default value is false;
   arg_3 -> Correspond to the number of digits
to be displayed.
   arg_4 -> Position of the least significant
digit (0 - leftmost, 3 - rightmost).*/
display.showNumberDec(temperature, false, 2,0);
/* display.setSegments(arg_1, arg_2, arg_3)
   arg_1 -> Segment information
   arg_2 -> Number of digits to be modified
(0-4)
   arg_3 -> Position from which to print (0 -
leftmost, 3 - rightmost)*/
  display.setSegments(celsius, 2, 2);
  delay(1000);
  while(1);
}
```