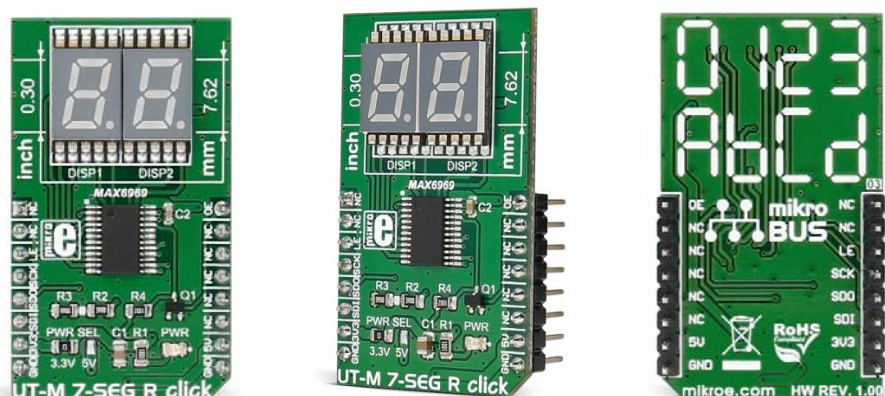


## UT-M 7-SEG R click

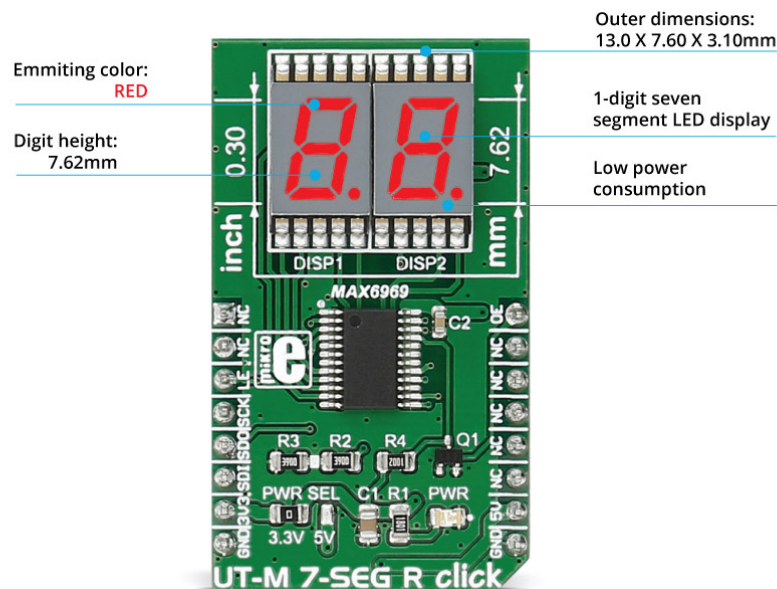
PID: MIKROE-2746



Add a **double 7 segment display** to your next project.

**UT-M 7-SEG R click** carries two SMD ultra thin LED 7-SEG displays and the MAX6969 constant-current LED driver from Maxim Integrated. The click is designed to run on either 3.3V or 5V power supply. It communicates with the target microcontroller over SPI interface.

## Display features



## How the click works

The 7 segment displays are interfaced to the MCU over the MAX6969 16-port, constant-current LED driver IC.

It uses the common 4-wire serial bus for communication with the MCU itself (LE, SCK, SDO, SDI on mikroBUS™ pin socket).

There is an additional OE (output enable) pin which is used to control the output driver state (enabled/disabled). Since it is the PWM output pin on the mikroBUS™ by default, the LED segments light intensity could be controlled by software too.

## MAX6969 driver features

The MAX6969 uses the industry-standard, shift-register-plus-latch-type serial interface.

The driver accepts data shifted into a 16-bit shift register using data input DIN and clock input CLK. Input data appears at the DOUT output 16 clock cycles later to allow **cascading of multiple MAX6969s**. So, the IC allows you to connect multiple click boards™ - for applications that require more than two seven segment displays, such as digital clocks, temperature sensors, etc.

## Specifications

|                  |                                                             |
|------------------|-------------------------------------------------------------|
| Type             | LED Segment                                                 |
| Applications     | Displaying digits and letters on two 7 segment displays     |
| Displays         | Ultra thin (3.1mm) LED 7-SEG displays in RED emitting color |
| On-board modules | MAX6969 6-Port, 5.5V Constant-Current LED Driver            |
| Key Features     | Excellent character appearance, low power consumption       |
| Interface        | SPI                                                         |
| Input Voltage    | 3.3V or 5V                                                  |
| Click board size | M (42.9 x 25.4 mm)                                          |

## Pinout diagram

This table shows how the pinout on **UT-M 7-SEG R click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

| Notes              | Pin   |  |      |     |    | Pin | Notes                          |
|--------------------|-------|-------------------------------------------------------------------------------------|------|-----|----|-----|--------------------------------|
|                    | NC    | 1                                                                                   | AN   | PWM | 16 | OE  | PWM control of light intensity |
|                    | NC    | 2                                                                                   | RST  | INT | 15 | NC  |                                |
| Load-Enable input  | LE    | 3                                                                                   | CS   | TX  | 14 | NC  |                                |
| Clock input        | SCK   | 4                                                                                   | SCK  | RX  | 13 | NC  |                                |
| Serial Data Output | SDO   | 5                                                                                   | MISO | SCL | 12 | NC  |                                |
| Serial Data Input  | SDI   | 6                                                                                   | MOSI | SDA | 11 | NC  |                                |
| Power supply       | +3.3V | 7                                                                                   | 3.3V | 5V  | 10 | +5V | Power supply                   |
| Ground             | GND   | 8                                                                                   | GND  | GND | 9  | GND | Ground                         |

## Jumpers and settings

| Designator | Name     | Default Position | Default Option | Description                                                                 |
|------------|----------|------------------|----------------|-----------------------------------------------------------------------------|
| JP1        | PRW.SEL. | Left             | 3V3            | Power Supply Voltage Selection 3V3/5V, left position 3V3, right position 5V |

## Programming

Code examples for UT-M 7-SEG R click, written for MikroElektronika hardware and compilers are available on Libstock.

### *Code snippet*

The following code snippet counts down from 99 to 0 on the displays of the UT-M 7-SEG R click.

```
01 sbit    MAX6969_LE_PIN    at    RC2_bit;
02 sbit    MAX6969_LE_PIN_Direction    at    TRISC2_bit;
03
04 uint16_t pwmPeriod;
05 static const uint8_t minus_char = 0x40;
06
07 void systemInit()
08 {
09     AD1PCFG = 0xFFFF;
10     MAX6969_LE_PIN_Direction = 0;
11     SPI3_Init();
12     pwmPeriod = PWM_Init(5000, 1, 1, 2);
13     PWM_Start(1);
14     PWM_Set_Duty(pwmPeriod/10, 1);
15
16 }
17
18 void MAX6969_Chip_Select()
19 {
20     MAX6969_LE_PIN = 1;
21     asm nop
22     asm nop
23     asm nop
24     MAX6969_LE_PIN = 0;
25 }
```

```

26
27 static void U7SEG_Write(uint8_t number)
28 {
29     char numbers[10] = {0x3F, 0x06, 0x5B, 0x4F, 0x66, 0x6D, 0x7D, 0x07,
0x7F, 0x6F};
30     uint8_t tens = number / 10;
31     uint8_t ones = number % 10;
32     if (number > 99) return;
33
34     SPI_Wr_Ptr(numbers[ones]);
35     SPI_Wr_Ptr(numbers[tens]);
36 }
37
38 void main()
39 {
40     uint8_t counter;
41
42     systemInit();
43     counter = 100;
44
45     while(counter--)
46     {
47         U7SEG_Write(counter);
48         MAX6969_Chip_Select();
49         Delay_ms(500);
50     }
51
52     SPI_Wr_Ptr(minus_char);
53     SPI_Wr_Ptr(minus_char);
54     MAX6969_Chip_Select();
55 }

```