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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
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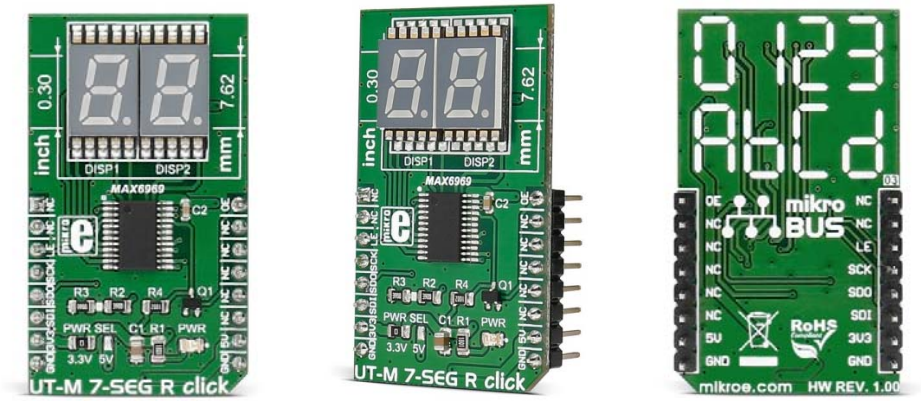
UT-M 7-SEG R click

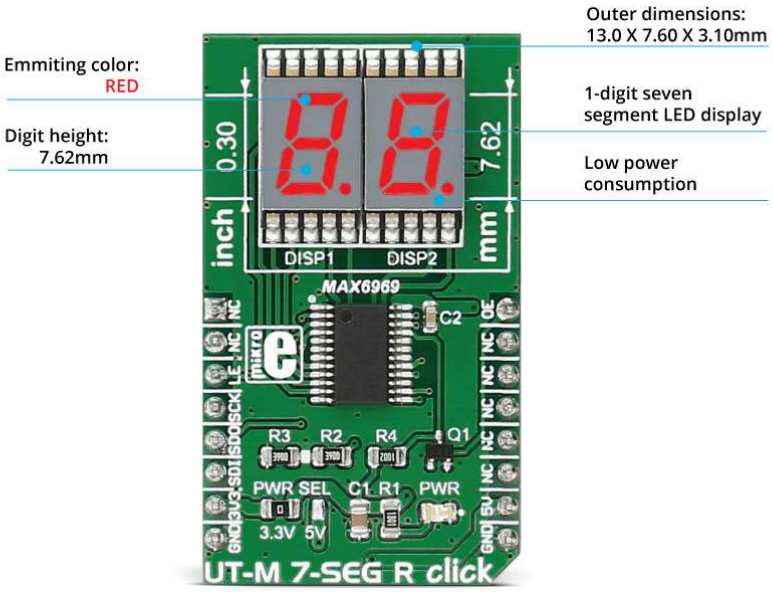
PID: MIKROE-2746



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		mikroBUS			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 }
```