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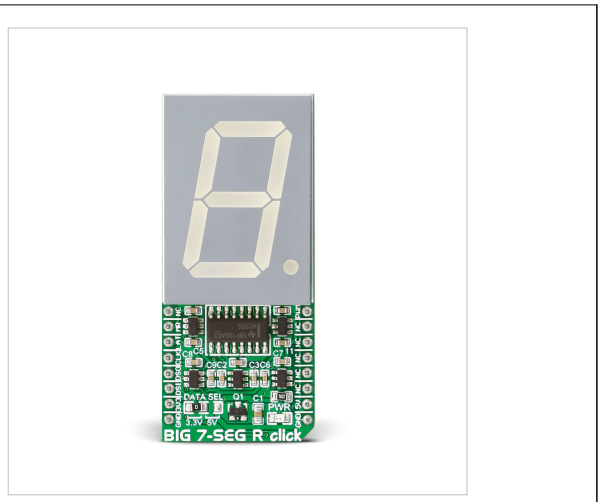
BIG 7-SEG R click

BIG 7-SEG R click



BIG 7-SEG R click	
IC/Module	SC10-21SRWA datasheet [1] 74HC595 datasheet [2]
Interface	SPI
Power supply	3.3V or 5V
Product page	BIG 7-SEG R click [3]
Schematic	BIG 7-SEG R click schematic [4]

BIG 7-SEG R click is what you need if you want to add a seven-segment **LED display** to your project. This click features an SC10-21SRWA 7-segment display. Communication between the MCU and the SC10-21SRWA display is established via serial-IN, parallel-OUT shift register 74HC595 IC.

The click runs on either a **3.3V** or **5V** power supply and communicates with the target MCU over an SPI interface.

Features and usage notes

Display

The click displays letters, numbers and symbols in highly readable form. It can be used in any simple interface and combined with other click boards. The color of the displayed character is red, as the R in the name of the click states.

Seven segment displays use different combinations of the segments to display symbols, most commonly Arabic numerals.

Each segment is connected to one of the pins on the 74HC595 IC.

Light intensity

The light intensity on the display is controlled via the **PWM pin** on the board.

Application

Adding a seven-segment LED display to your device with SPI interface. It can be used for digital clocks, vending machine displays, electronic meters and many other devices.

Key features

- SC10-21SRWA display
  - 1.0 inch digit height
  - Standard: gray face, white segment
  - Low current operation
- Serial-IN, parallel-OUT shift register 74HC595 IC
- Interface: SPI
- 3.3V or 5V power supply

Pinout diagram

This table shows how the pinout on BIG 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
Not connected	NC	1	AN	PWM	16	**PWM**	Display light intensity control
Master Reset for 74HC595	**MR**	2	RST	INT	15	NC	Not connected
Latch for 74HC595	**LAT**	3	CS	TX	14	NC	Not connected
Clock for 74HC595	**CLK**	4	SCK	RX	13	NC	Not connected
Serial Data from 74HC595 to MCU	**DSO**	5	MISO	SCL	12	NC	Not connected
Serial Data from MCU to 74HC595	**DSI**	6	MOSI	SDA	11	NC	Not connected
Data line when interfaced with 3.3V MCU	**3.3V**	7	+3.3V	+5V	10	**5V**	Data line when interfaced with 5V MCU and also power supply pin for display and the whole click hardware
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Jumpers and settings

Information about onboard jumpers:

Designator	Name	Default Position	Default Option	Description: describe the use + list all options with respective descriptions
JP1	Logic level	Left	3.3V	Logic Level Selection toward host mcu 3.3V/5V, left position 3.3V, right position 5V

Programming

This demo is using BIG 7-SEG R click board to display characters in an endless loop, with fixed time interval whilst changing its PWM duty.

- Operating Voltage Range: 2.0 to 6.0 V
- Operating Temperature: – 55 to 125 C

This example for STM32F107VC MCU (EasyMx PRO v7 for ARM), resets and initializes the BIG 7-SEG R click board takes characters from the static array and displays them while changing PWM duty cycle, all in an endless loop.

```
  extern char dig_array[MAX_CHARACTERS];

  // Variables
  unsigned short counter;
  unsigned int luminosity;
  unsigned int pwm_period;
  int8_t valid;

  char demo_array[20] =
  { 'M', 'I', 'K', 'R', 'O',
    'E', 'L', 'E', 'K', 'T', 'R', 'O', 'N', 'I', 'K', 'A',
    '2', '0', '1', '6'
  };

  void main()
  {
   // MCU Init
   GPIO_Digital_Output(&GPIOD_ODR, _GPIO_PINMASK_13);      // Set
PORTD.B13 as digital input
   GPIO_Digital_Output(&GPIOC_ODR, _GPIO_PINMASK_2);       // Set
PORTC.B2 as digital output

   // SPI Init
   SPI3_Init_Advanced( _SPI_FPCLK_DIV16, _SPI_MASTER | _SPI_8_BIT |
  _SPI_CLK_IDLE_LOW | _SPI_FIRST_CLK_EDGE_TRANSITION |
  _SPI_MSB_FIRST | _SPI_SS_DISABLE | _SPI_SSM_ENABLE |
  _SPI_SSI_1, &_GPIO_MODULE_SPI3_PC10_11_12 );

   // PWM Init
   pwm_period = PWM_TIM5_Init(5000);                       // PWM Init
on 5kHz
   PWM_TIM5_Set_Duty(100, _PWM_NON_INVERTED, _PWM_CHANNEL1);
   PWM_TIM5_Start(_PWM_CHANNEL1, &_GPIO_MODULE_TIM5_CH1_PA0);

   // 74HC595 Init
   HC595_LAT = 0;
   HC595_RES = 0;
   HC595_reset();
```

```
   // Init counter and segment luminosity
   counter = 0;
   luminosity = 0;

   // Endless loop
   while (1)
    {
     valid = seg_7_display(demo_array[counter]);
     PWM_TIM5_Set_Duty(100 + luminosity, _PWM_NON_INVERTED,
_PWM_CHANNEL1);
     delay_ms(750);
     luminosity += 100;
     counter++;
     if (counter == 20)
       counter = 0;
     if (luminosity == 4000)
       luminosity = 0;
    }
  }
```

Resources

- BIG 7-SEG R click schematic [4]
- SC10-21SRWA datasheet [1]
- 74HC595 datasheet [2]
- Libstock Library [5]
- mikroBUS™ standard specifications [6]

References

[1] http://www.kingbrightusa.com/images/catalog/SPEC/SC10-21SRWA.pdf
[2] http://www.ti.com/lit/ds/symlink/sn74hc595.pdf
[3] https://shop.mikroe.com/click/display/big-7-seg-r
[4] http://cdn-docs.mikroe.com/images/a/a1/BIG_7-SEG_R_click_schematic.pdf
[5] http://libstock.mikroe.com/projects/view/1979/big-7-seg-r-click
[6] http://download.mikroe.com/documents/standards/mikrobus/mikrobus-standard-specification-v200.pdf

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