

# LCD mini click

PID: MIKROE-2453

Weight: 37 g



**LCD mini click** displays 2x16 monochrome characters on an LMB162XFW LCD display. It features the MCP23S17 port expander and the MCP4161 digital potentiometer, both from Microchip. LCD mini click is designed to run on either 3.3V or 5V power supply. It communicates with the target microcontroller over SPI interface and the following pins on the mikroBUS™ line: PWM, INT, RST, AN.

## LCD and backlight control

The PWM pin onboard the LCD mini click is used for backlight control. While the digital potentiometer is used for contrast adjustments.

## 2x16 LCD display features

2x16 LDC displays are ideal for displaying short messages and numbers. They can display 16 characters per one line, 32 in total. The 5x8 dot font displays characters, symbols, and numbers clearly and vividly.

## Key features

- 16x2 monochrome display
- LMB162XFW LCD
  - White LED backlight
  - Outline dimension: 53.0x20.0x9.1MAX
  - Display color: deep blue, light yellow green
- MCP23S17 IC
  - External Reset input
  - Low standby current: 1  $\mu$ A (max.)
- MCP4161 IC
  - Low Wiper Resistance: 75 $\Omega$  (typical)
  - Serial Interface Inactive current (2.5 uA typical)
- Interface: SPI
- 3.3V or 5V power supply

## Specification

Product Type	LCD
Applications	Interfacing 2x16 LED displays with mikroBUS™ compatible development boards
On-board modules	MCP23S17 port expander, MCP4161 digital potentiometer - both from Microchip
Key Features	Adapter for connecting 2x16 LCD displays, MCP23S17 port expander, MCP4161 digital potentiometer
Key Benefits	Onboard port expander for LCD control, digital potentiometer for contrast settings, PWM for backlight control.
Interface	SPI
Power Supply	3.3V or 5V
Compatibility	mikroBUS
Click board size	S (28.6 x 25.4 mm)

## Pinout diagram

This table shows how the pinout on **LCD mini click** corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS™				Pin	Notes
		1	AN	PWM	16		
Digipot CS	<b>CS2</b>	1	AN	PWM	16	<b>PWM</b>	Pulse-Width Modulation
Reset for the port expander	<b>RST</b>	2	RST	INT	15	<b>INT</b>	INT from the port expander
SPI chip select	<b>CS</b>	3	CS	RX	14	NC	Not connected
SPI clock	<b>SCK</b>	4	SCK	TX	13	NC	Not connected
SPI Master Input Slave Output	<b>MISO</b>	5	MISO	SDA	12	NC	Not connected
SPI Master Output Slave Input	<b>MOSI</b>	6	MOSI	SDA	11	NC	Not connected
Power supply	<b>+3.3V</b>	7	3.3V	5V	10	<b>+5V</b>	Power supply
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Programming

The demo shows how to use the SPI LCD library to communicate with the LCD (with HD44780 compliant controllers) in 4-bit mode via the SPI interface. It also uses the PWM for the backlight and the on board digital potentiometer, for controlling display contrast, which can be accessed through SPI. The demo iterates through all the values for the backlight and the contrast intensity.

### Code snippet

The main function of the demo.

```
01 void main()  
02 {  
03     system_init();  
04  
05     SPI_Lcd_Out(1, 6, "mikroE");  
06     SPI_Lcd_Out(2, 2, "LCD mini click");
```

```
07
08  set_bcklight(0xFF);
09  set_contrast(0xDF);
10
11  Delay_ms(5000);
12
13  while (1)
14  {
15      set_bcklight(value);
16      set_contrast(value);
17
18      value++;
19      delay_ms(40);
20  }
21 }
```