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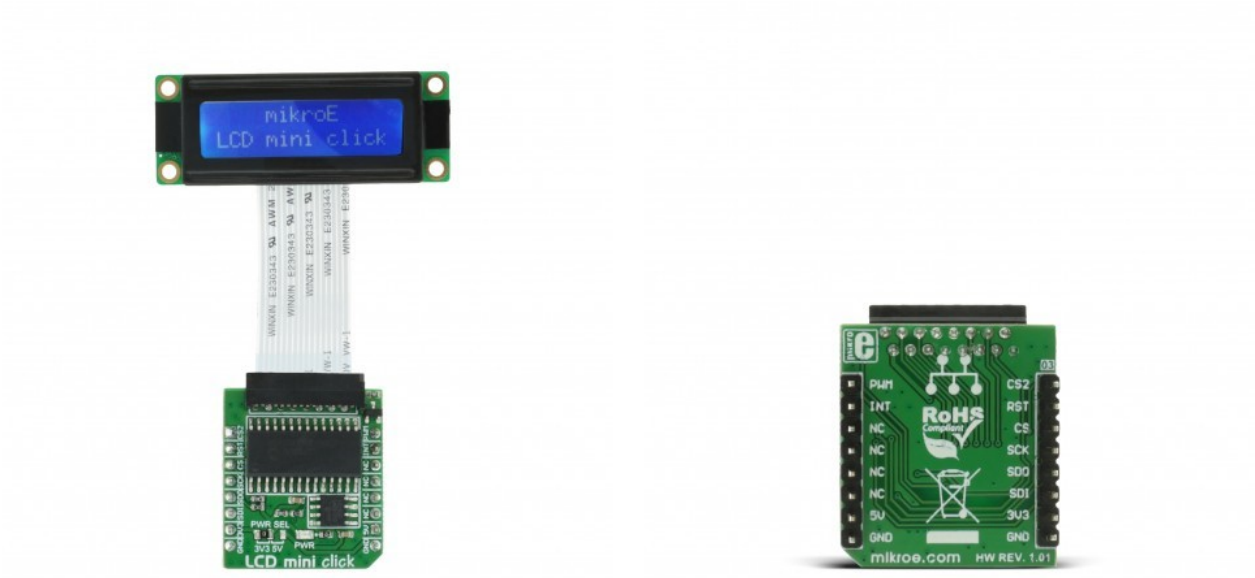
LCD mini Click



PID: MIKROE-2453

LCD Mini Click is a compact add-on adapter board that allows you to interface an LMB162XFW LCD display to any microcontroller. This board features the MCP23S17, a 16-bit I/O expander with a serial interface from Microchip. It allows you to display 2x16 monochrome characters on an LMB162XFW LCD display and is ideal for displaying short messages or numbers in a pattern of 16 characters per line, 32 in total. The LCD display consists of 2x16 matrices, each of 5x8 dots, which allows you to display not only letters and numbers but all kinds of symbols clearly and vividly. This Click board™ makes the perfect solution for developing short message information applications, user interfaces, control panels, and more.

LCD Mini Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

LCD Mini Click is based on the MCP23S17, a 16-bit I/O expander with a serial interface from Microchip. The MCP23S17 has an external reset input and a configurable interrupt source, which can also be configured as active-high or active-low. This bidirectional I2C expander bridges the host MCU and four data bit pins, an enable control pin, and a register select pin for the display. For it to work, the enable pin should be held HIGH. The register selects pin toggles between command mode (logic LOW) and data mode (logic HIGH). The brightness of the backlight LED can be controlled directly over the host MCU, but for the control of the contrast of the LCD, there is the MCP4161, an 8-bit single SPI digital POT with non-volatile memory from Microchip.

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LCD Mini Click uses a standard 4-Wire SPI serial interface from both the I2C expander and the digital potentiometer to communicate with the host MCU. The MCP23S17 supports a high-speed SPI interface of up to 10MHz and can be selected over the CS pin and reset over the RST pin. It sends interrupts over the INT pin. The MCP4161 also supports high-speed SPI of up to 10MHz and can be selected over the CS2 pin. The PWM pin can be used to control the brightness of the LCD display's backlight LED.

The LMB162XFW display with an appropriate cable does not come with the LCD Mini Click adapter board and is offered separately. However, the LCD Mini Click has an appropriate connector to interface the LCD display.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the PWR SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. However, the Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	Adapter,LCD
Applications	Can be used for developing short message information applications, user interfaces, control panels, and more
On-board modules	MCP23S17 - 16-bit I/O expander with a serial interface from Microchip
Key Features	Adapter Click boardTM for connecting 2x16 LCD displays, MCP23S17 I/O port expander, MCP4161 digital potentiometer, high-speed SPI interface of up to 10MHz, backlight brightness control, contrast control, register select between command mode and data mode, and more
Interface	GPIO,SPI
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

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
DIGIPOT SPI Select	**CS2**	1	AN	PWM	16	**PWM**	Backlight Brightness Control
Reset	**RST**	2	RST	INT	15	**INT**	Interrupt

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SPI Chip Select	**CS**	3	CS	RX	14	NC	
SPI Clock	**SCK**	4	SCK	TX	13	NC	
SPI Data OUT	**SDO**	5	MISO	SCL	12	NC	
SPI Data IN	**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

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	PWR SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

LCD mini Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V

Software Support

We provide a library for the LCD mini Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for LCD mini Click driver.

Key functions

- lcdmini_set_backlight Set backlight function.
- lcdmini_set_contrast Set contrast function.
- lcdmini_display_text LCD mini display text.

Example Description

This is an example that demonstrates the use of the LCD mini Click board.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board

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- MikroSDK.Log
- Click.LCDmini

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

Click board™ Catalog

Click Boards™

Downloads

LCD mini click example on Libstock

MCP4161 datasheet

MCP23S17 datasheet

LCD mini click schematic v101

LCD mini click 2D and 3D files v101