MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
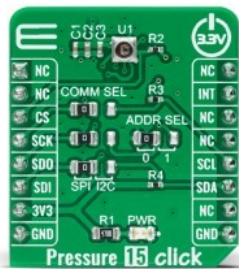Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
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Pressure 15 Click

PID: MIKROE-4747

Pressure 15 Click is a compact add-on board that contains a board-mount pressure sensor. This board features the LPS27HHW, an ultra-compact piezoresistive absolute pressure sensor that functions as a digital output barometer from STMicroelectronics. The device comprises a sensing element and an IC interface that communicates through I2C or SPI serial interface from the sensing element to the application. The sensing element, which detects absolute pressure in a range of 260 up to 1260hPa, consists of a suspended membrane manufactured using a dedicated process developed by STMicroelectronics. This Click board™ is suitable for weather station equipment, altimeter and barometer applications, industrial, consumer applications, and many more.

Pressure 15 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?

Pressure 15 Click as its foundation uses the LPS27HHW is a high-resolution, ultra-compact piezoresistive absolute pressure sensor that functions as a digital output barometer from STMicroelectronics. The complete device includes a sensing element based on a piezoresistive Wheatstone bridge approach which detects absolute pressure in a range of 260 up to 1260hPa, and a serial interface that communicates a digital signal from the sensing element to the application.
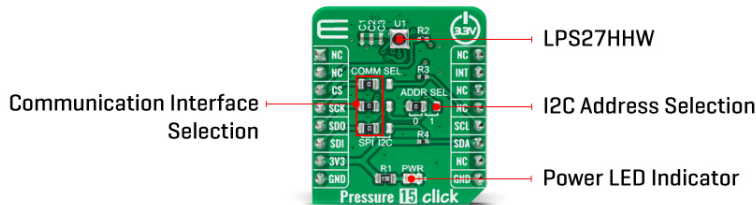
The LPS27HHW has a unique cylindrical package solution with an entire metal lid assembled on a ceramic substrate. When pressure is applied, the membrane deflection induces an imbalance in the Wheatstone bridge piezoresistance, whose output signal is then converted by the chosen serial interface.

Pressure 15 Click provides the possibility of using both I2C and SPI interfaces with a maximum frequency of 100kHz in Standard and 400kHz in Fast mode for I2C and 8MHz for SPI communication. The selection can be made by positioning SMD jumpers labeled as COMM SEL to an appropriate position. Note that all the jumpers' positions must be on the same side, or else the Click board™ may become unresponsive. While the I2C interface is selected, the LPS27HHW allows the choice of the least significant bit (LSB) of its I2C slave address using the SMD jumper labeled as ADDR SEL.

Also, the LPS27HHW features a Data-Ready signal, routed on the INT pin of the mikroBUS™ socket, which indicates when a new set of measured pressure data are available, simplifying data synchronization in the digital system that uses the device.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before use with MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used, as a reference, for further development.

Specifications

Type	Pressure
Applications	Can be used for weather station equipment, altimeter and barometer applications, industrial, consumer applications, and many more
On-board modules	LPS27HHW, high-resolution, ultra-compact piezoresistive absolute pressure sensor that functions as a digital output barometer from STMicroelectronics
Key Features	Low power consumption, high precission, wide absolute pressure measurement range, selectable serial interface, selectable I2C slave

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	address, interrupt/data-ready feature, and more
Interface	I2C,SPI
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Pressure 15 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS			Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	**INT**	Interrupt
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	**SCL**	I2C Clock
SPI Data IN	**SDI**	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1/JP3/JP4	COMM SEL	Left	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP2	ADD SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Pressure 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Pressure Range	260	-	1260	hPa
Pressure Output Data Resolution	-	24	-	bits
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Pressure 15 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

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

Library Description

This library contains API for Pressure 15 Click driver.

Key functions:

- pressure15_cfg_setup - Config Object Initialization function.
- pressure15_init - Initialization function.
- pressure15_default_cfg - Click Default Configuration function.

Examples description

The demo application is composed of two sections :

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

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Pressure15

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. The terminal available in all MikroElektronika compilers, or any other terminal application of your choice, can be used to read the message.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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™

mikroSDK

Click board™ Catalog

Click boards™

Downloads

[Pressure 15 click 2D and 3D files](#)

[LPS27HHW datasheet](#)

[Pressure 15 click schematic](#)

[Pressure 15 click example on Libstock](#)