

Barometer 8 Click



PID: MIKROE-5128

Barometer 8 Click is a compact add-on board used to measure air pressure in a specific environment. This board features the [ILPS22QS](#), an ultra-compact piezoresistive absolute pressure sensor that functions as a digital output barometer from [STMicroelectronics](#). The ILPS22QS comprises a sensing element and an IC chip for signal processing in one package, converts pressure into a 24-bit digital value, and sends the information via a configurable host interface that supports SPI and I2C serial communications. It has a selectable dual full-scale absolute pressure range, up to 1260hPa and 4060hPa, with an accuracy of 0.5hPa over a wide operating temperature range. This Click board™ is suited for various pressure-based applications, industrial, consumer, weather stations, and more.

Barometer 8 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?

Barometer 8 Click as its foundation uses the ILPS22QS, a high-accuracy absolute pressure sensor that functions as a digital output barometer from STMicroelectronics. The ILPS22QS delivers ultra-low pressure noise with low power consumption and operates over an extended temperature range from -40°C to +105°C. It has a selectable dual full-scale absolute pressure range, from 260 up to 1260hPa or 4060hPa, with an accuracy of 0.5hPa, ideally suited to the harsh environmental conditions in industrial and consumer applications.

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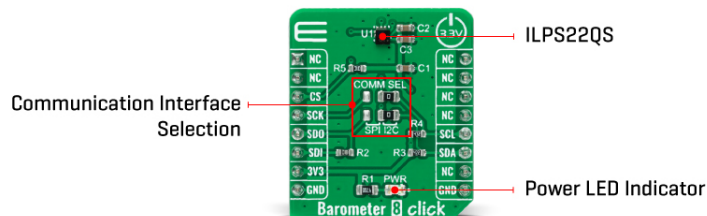
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The ILPS22QS comprises a sensing element based on a piezoresistive Wheatstone bridge approach and an IC interface that provides a digital signal from the sensing element to the application. The sensing element, which detects absolute pressure, consists of a suspended membrane manufactured using a dedicated process developed by ST. A silicon spring structure surrounds this silicon membrane, and it contributes to isolating the membrane from mechanical and thermal stress in applications. When pressure is applied, the membrane deflection induces an imbalance in the Wheatstone bridge piezoresistance, whose output signal is converted by the selected interface.

This Click board™ allows using both I2C and SPI interfaces with a maximum frequency of 1MHz 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 the Click board™ may become unresponsive.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using 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 various pressure-based applications, industrial, consumer, weather stations, and more
On-board modules	ILPS22QS - high-accuracy absolute pressure sensor that functions as a digital output barometer from STMicroelectronics
Key Features	Low power consumption, selectable dual full-scale absolute pressure range, low pressure sensor noise, high-performance, embedded temperature compensation, extended temperature range, and more
Interface	I2C,SPI
ClickID	No

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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 Barometer 8 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	NC	
	NC	2	RST	INT	15	NC	
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-JP2	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C

Barometer 8 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Pressure Range	260	-	1260(4060)	hPa
Accuracy	-	0.5	-	hPa
Resolution	-	24	-	bits
Operating Temperature Range	-40	+25	+105	°C

Software Support

We provide a library for the Barometer 8 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

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This library contains API for Barometer 8 Click driver.

Key functions

- `barometer8_write_register` This function writes a desired data byte to the selected register.
- `barometer8_read_register` This function reads a data byte from the selected register.
- `barometer8_read_data` This function reads the pressure and temperature raw data and converts them to mBar and Celsius.

Example Description

This example demonstrates the use of Barometer 8 Click board™ by reading and displaying the pressure and temperature values.

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.Barometer8

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 MikroElektronika [compilers](#).

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

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[Barometer 8 click example on Libstock](#)

[ILPS22QS datasheet](#)

[Barometer 8 click 2D and 3D files](#)

[Barometer 8 click schematic](#)

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