

Barometer 10 Click



PID: MIKROE-5601

Barometer 10 Click is a compact add-on board that measures air pressure in a specific environment. This board features the [LPS28DFW](#), an ultra-compact piezoresistive absolute pressure sensor that functions as a digital output barometer from [STMicroelectronics](#). The LPS28DFW 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 I2C serial interface. It has a selectable dual full-scale absolute pressure range of up to 1260hPa and 4060hPa, with an absolute pressure accuracy of 0.5hPa over a wide operating temperature range. This Click board™ is suitable for various pressure-based industrial, consumer, weather stations, and more applications.

How does it work?

Barometer 10 Click is based on the LPS28DFW, a high-accuracy absolute pressure sensor that functions as a digital output barometer from STMicroelectronics. The LPS28DFW delivers ultra-low pressure noise with low power consumption and operates over an extended temperature range. It has a selectable dual full-scale absolute pressure range, from 260 up to 1260hPa or 4060hPa, with an absolute pressure accuracy of 0.5hPa, ideally suited to the harsh environmental conditions in industrial and consumer applications.

Mikroe produces entire development toolchains for all major microcontroller architectures.

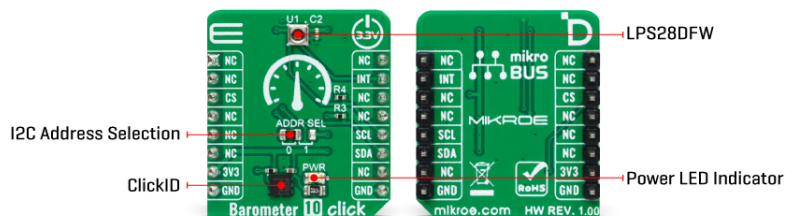
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



The LPS28DFW has a unique cylindrical package solution with a full metal lid assembled on a ceramic substrate. This cylindrical package provides the easy assembly with O-rings in the end user's application. Its sensing element is based on a piezoresistive Wheatstone bridge approach with an interface that provides a digital signal from the sensing element to the application. The sensing element, which detects absolute pressure, consists of a silicon membrane manufactured using a dedicated process developed by ST. When pressure is applied, the membrane deflection induces an imbalance in the Wheatstone bridge piezoresistance, whose output signal is converted by the serial interface into a 24-bit output pressure data.

The trimming values are stored inside the LPS28DFW in a non-volatile structure. When the LPS28DFW is turned on, the trimming parameters are downloaded into the registers to be employed during normal operation, allowing the device to be used without further calibration.

This Click board™ communicates with an MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Fast-Plus mode with a frequency of up to 1MHz. In addition, the LPS28DFW allows choosing the least significant bits (LSB) of its I2C slave address using the SMD jumper labeled ADDR SEL. The LPS28DFW features a data-ready signal, routed on the INT pin of the mikroBUS™ socket, which indicates when a new set of measured pressure and temperature data are available, thus simplifying data synchronization in the digital system that uses the device.

This Click board™ can only be operated 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 industrial, consumer, weather stations, and more applications
On-board modules	LPS28DFW - dual full-scale absolute pressure sensor from STMicroelectronics
Key Features	Low power consumption, selectable dual full-

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.




ISO 9001: 2015 certification of quality management system (QMS).

	scale absolute pressure range, low pressure sensor noise, high-performance, embedded temperature compensation, extended temperature range, embedded FIFO, interrupt function, and more
Interface	I2C
Feature	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 Barometer 10 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	INT	Interrupt
ID COMM	CS	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	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	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Barometer 10 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Pressure Range	260	-	1260(4060)	hPa
Pressure Sensitivity	-	4096(2048)	-	LSB/hPa
Absolute Pressure Accuracy	-	0.5	-	hPa
Resolution	-	24	-	bits

Software Support

We provide a library for the Barometer 10 Click as well as a demo application (example),

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

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 Barometer 10 Click driver.

Key functions

- barometer10_get_pressure Barometer 10 gets pressure function.
- barometer10_get_temperature Barometer 10 gets temperature function.

Example Description

This example demonstrates the use of the Barometer 10 Click board™. The demo application reads and calculates pressure and temperature data.

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
- MikroSDK.Log
- Click.Barometer10

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, that needs to be downloaded from the [LibStock](#) and installed for the compiler you are using to ensure proper operation of mikroSDK compliant Click board™ demo applications.

For more information about mikroSDK, visit the [official page](#).

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.
Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

[Click boards™](#)

[ClickID](#)

Downloads

[Barometer 10 click 2D and 3D files v100](#)

[LPS28DFW datasheet](#)

[Barometer 10 click example on Libstock](#)

[Barometer 10 click schematic v100](#)

Mikroe produces entire development toolchains for all major microcontroller architectures.

Committed to excellency, we are dedicated to helping engineers bring the project development up to speed and achieve outstanding results.



ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Mikroe:](#)

[MIKROE-5601](#)