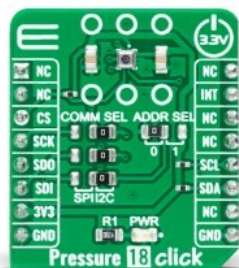


Pressure 18 Click



PID: MIKROE-5296

Pressure 18 Click is a compact add-on board that contains a board-mount pressure sensor. This board features the [BMP384](#), a robust barometric pressure sensor delivering market-leading accuracy in a compact package from [Bosch Sensortec](#). The BMP384 provides a relative accuracy of $\pm 9\text{Pa}$ and typical absolute accuracy of $\pm 50\text{Pa}$ with ultra-low noise, low power consumption, and a temperature coefficient offset of $\pm 1\text{Pa/K}$. It converts output data into a 24-bit digital value and sends the information via a configurable host interface that supports SPI and I2C serial communications. It measures pressure from 300hPa to 1250hPa over a wide operating temperature range. This Click board™ is suited for various pressure-based applications, altitude tracking, industrial, consumer, weather stations, and more.

Pressure 18 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 18 Click as its foundation uses the BMP384, a high accuracy, low-power, and low noise 24-bit absolute barometric pressure sensor from Bosch Sensortec. The BMP384 consists of a piezo-resistive pressure sensing element and a mixed-signal ASIC that performs A/D conversions and provides the conversion results alongside sensor-specific compensation data through a digital interface. It also provides the highest flexibility and can be adapted to the requirements regarding accuracy, measurement time, and power consumption by selecting many possible combinations of the sensor settings.

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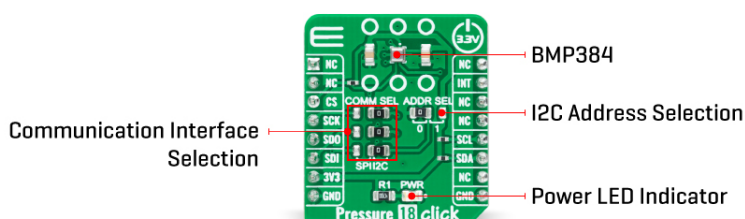
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The BMP384 is very accurate, covering a wide measurement pressure range from 300hPa to 1250hPa, alongside a relative accuracy of $\pm 9\text{Pa}$ (equivalent to $\pm 75\text{cm}$ difference in altitude), the typical absolute accuracy of $\pm 50\text{Pa}$, and a temperature coefficient offset of $\pm 1\text{Pa/K}$. This feature makes it suitable for water-level detection and differential barometric pressure measurements.

This sensor operates in three power modes: Sleep, Normal, and Forced Mode. The Normal Mode comprises automated perpetual cycling between an active measurement period and an inactive Standby period. In Sleep Mode, no measurements are being performed, while in Forced Mode, a single measurement performs. When a measurement is finished, the BMP384 returns to Sleep Mode. Also, a set of oversampling settings are available, ranging from ultra-low power to highest resolution setting to adapt the Click board™ to the target application.

Pressure 18 Click allows using both I2C and SPI interfaces with a maximum frequency of 3.4MHz for I2C and 10MHz for SPI communication. The selection can be made by positioning SMD jumpers labeled as COMM SEL in an appropriate position. Note that all the jumpers' positions must be on the same side, or the Click board™ may become unresponsive. While the I2C interface is selected, the BMP384 allows choosing the least significant bit (LSB) of its I2C slave address using the SMD jumper labeled ADDR SEL. This Click board™ also possesses an additional interrupt pin, routed to the INT pin on the mikroBUS™ socket, indicating when a specific interrupt event occurs, such as FIFO overflow, data-ready, and more.

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, altitude tracking, industrial, consumer, weather stations, and more
On-board modules	BMP384 - absolute barometric pressure sensor from Bosch Sensortec
Key Features	Low power consumption and low noise,

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	accuracy, wide measurement range, performance, interrupt feature, selectable interface, long-term stability, 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 18 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
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	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP4	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Pressure 18 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Pressure Measurement Range	300	-	1250	hPa
Relative Pressure Accuracy	-	±9	-	Pa
Absolute Pressure Accuracy	-	±50	-	Pa
Resolution	-	24	-	bit
Operating Temperature Range	-40	+25	+85	°C

Software Support

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We provide a library for the Pressure 18 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 18 Click driver.

Key functions

- `pressure18_get_int_pin` This function returns the INT pin logic state.
- `pressure18_read_data` This function reads the sensor measurements data: pressure in Pascals and temperature in Celsius.
- `pressure18_soft_reset` This function performs the software reset feature.

Example Description

This example demonstrates the use of Pressure 18 Click board™ by reading and displaying the pressure and temperature measurements.

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.Pressure18

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

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[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click Boards™](#)

Downloads

[BMP384 datasheet](#)

[Pressure 18 click 2D and 3D files](#)

[Pressure 18 click schematic](#)

[Pressure 18 click example on Libstock](#)

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