

# Barometer 5 Click



PID: MIKROE-4924

**Barometer 5 Click** is a compact add-on board used to measure air pressure in a specific environment. This board features the MS5637-02BA03, a high accuracy low voltage barometric and temperature sensor from TE Connectivity Measurement Specialties. The MS5637-02BA03 includes a high-linearity pressure sensor and an ultra-low-power 24-bit  $\Delta\Sigma$  ADC with internal factory-calibrated coefficients, providing a precise digital 24-bit pressure and temperature value, and different operation modes allowing the user to optimize for conversion speed and current consumption. It comes with a configurable host interface that supports I2C serial communication and measures pressure in a range from 300mbar up to 1.2bar with an accuracy of  $\pm 2$ mbar over a wide operating temperature range. This Click board™ is suited for various pressure-based applications, especially when low power consumption is required.

Barometer 5 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 5 Click as its foundation uses the MS5637-02BA03, a high accuracy low voltage barometric and temperature sensor from TE Connectivity Measurement Specialties, to measure air pressure in a specific environment. This new sensor module generation is based on leading MEMS technology, where the sensing principle leads to very low hysteresis and high stability of both pressure and temperature signal. It consists of a piezoresistive sensor and a sensor interface integrated circuit. The primary function of the MS5637-02BA03 is to convert and provide the uncompensated analog output voltage from the piezoresistive pressure sensor to a 24-bit digital value for the temperature of the sensor. It can measure pressure in a range from

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.

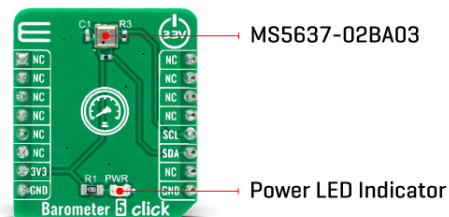


ISO 27001: 2013 certification of informational security management system.  
ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



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

300mbar up to 1.2bar with an accuracy of  $\pm 2$ mbar over a wide operating temperature range at the industry's lowest power.



As mentioned before, the MS5637-02BA03 has integrated ultra-low-power 24-bit  $\Delta\Sigma$  ADC with internal factory-calibrated coefficients, which alongside precise pressure value, also provides temperature value. A high-resolution temperature output allows the implementation of an altimeter/thermometer function without any additional sensor, with an altitude resolution at sea level of 13cm of air.

Barometer 5 Click communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Standard Mode operation with a clock frequency of 100kHz and Fast Mode up to 400kHz. Besides, it also offers different operation modes allowing the user to optimize for conversion speed and current consumption.

Suppose the user decides not to use our compliant library but to do software development independently. In that case, it is recommended to compensate for the non-linearity over the temperature to obtain the best accuracy over the temperature range, particularly at low temperatures. This can be achieved by correcting the calculated temperature, offset, and sensitivity by a second-order correction factor.

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, especially when low power consumption is required                                                                      |
| On-board modules | MS5637-02BA03 - high accuracy low voltage barometric and temperature sensor from TE Connectivity Measurement Specialties, to measure air pressure in a specific environment |
| Key Features     | Low power consumption, high resolution and                                                                                                                                  |

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).

|                  |                                                                                                                                                                          |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | precision, embedded temperature sensor, temperature stability, accuracy of $\pm 2$ mbar over a wide operating temperature range, also measure altitude of 13cm, and more |
| Interface        | I2C                                                                                                                                                                      |
| 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 Barometer 5 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 | NC         |           |
|              | NC          | 3                                                                                 | CS   | RX  | 14 | NC         |           |
|              | NC          | 4                                                                                 | SCK  | TX  | 13 | NC         |           |
|              | NC          | 5                                                                                 | MISO | SCL | 12 | <b>SCL</b> | I2C Clock |
|              | NC          | 6                                                                                 | MOSI | SDA | 11 | <b>SDA</b> | I2C Data  |
| Power Supply | <b>3.3V</b> | 7                                                                                 | 3.3V | 5V  | 10 | NC         |           |
| Ground       | <b>GND</b>  | 8                                                                                 | GND  | GND | 9  | <b>GND</b> | Ground    |

## Onboard settings and indicators

| Label | Name | Default | Description         |
|-------|------|---------|---------------------|
| LD1   | PWR  | -       | Power LED Indicator |

## Barometer 5 Click electrical specifications

| Description                 | Min | Typ     | Max  | Unit |
|-----------------------------|-----|---------|------|------|
| Supply Voltage              | 3.3 | -       | 5    | V    |
| Operating Pressure Range    | 300 | -       | 1200 | mbar |
| Accuracy                    | -   | $\pm 2$ | -    | mbar |
| ADC Resolution              | -   | 24      | -    | bit  |
| Operating Temperature Range | -40 | +25     | +85  | °C   |

## Software Support

We provide a library for the Barometer 5 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](#).

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).

## Library Description

This library contains API for Barometer 5 Click driver.

Key functions

- barometer5\_get\_data Barometer 5 get data function.
- barometer5\_get\_pressure Barometer 5 get pressure data function.
- barometer5\_get\_temperature Barometer 5 get temperature data function.

## Example Description

This library contains API for Barometer 5 Click driver. The demo application reads and calculate temperature and pressure data.

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.Barometer5

## 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

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).

[MS5637-02BA03 datasheet](#)

[Barometer 5 click 2D and 3D files](#)

[Barometer 5 click schematic](#)

[Barometer 5 click example on Libstock](#)

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).