

# Pressure 23 Click - 30BA



PID: MIKROE-5768

**Pressure 23 Click** is a compact add-on board that contains a board-mount pressure sensor. This board features the MS5849-30BA, an ultra-compact chlorine-resistant absolute pressure sensor from TE Connectivity. The sensor is a small digital altimeter operating from 300 up to 30000mbar, optimized for applications where chlorine is present. The sensor's stainless-steel housing is filled with gel, which makes it robust and enables it to work in harsh environments. This Click board™ makes the perfect solution for the development of safety devices in seawater, medical portable devices, disposable – drug treatment, mildly corrosive gases, liquid measurements, and more.

Pressure 23 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 23 Click is based on the MS5849-30BA, an ultra-compact chlorine-resistant absolute pressure sensor from TE Connectivity. It provides precise digital 24-bit pressure and temperature values and different operation modes, allowing the user to optimize conversion speed and current consumption. The sensor features built-in automatic conversion, signaling state by interrupt, a programmable filter, and more. The sensor delivers a decent pressure sensing accuracy, which depends on the pressure measuring range. On lower pressures, it is as low as  $\pm 50\text{mbar}$ . In addition to pressure, this sensor can measure the temperature, which is needed for temperature compensation in a range of  $-20$  up to  $85^\circ\text{C}$  with a temperature sensing accuracy of  $\pm 2^\circ\text{C}$ .

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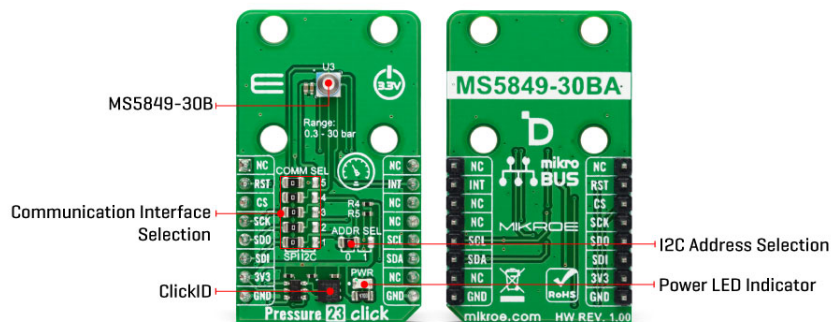
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The MS5849-30BA includes a high linearity pressure sensor and an ultra-low power delta-sigma ADC with internal factory-calibrated coefficients. The sensor consists of a piezo-resistive sensor and a sensor interface integrated circuit. It converts the sensor's uncompensated analog output value voltage to a 24-bit digital value. The sensor is individually factory calibrated, where, as a result, ten coefficients necessary to compensate for process variations and temperature variations are calculated and stored in the 256-bit NVRAM of the sensor.

The sensor and the sealing gel on it shouldn't be touched or damaged in any way. In applications such as outdoor watches, the electronics must be protected against direct water or humidity. For such applications, the MS5849-30BA provides the possibility to seal with an O-ring.

Pressure 23 Click can communicate with the host MCU using the 4-Wire SPI serial interface and the I2C interface. The SPI interface supports clock frequencies up to 20MHz, while the I2C clock supports up to 3.4MHz. The desired communication interface can be chosen over the 5 COMM SEL jumpers, where the SPI is set by default. If your goal is the I2C, you can choose the I2C address over the ADDR SEL jumper (0 set by default). The interrupt on the INT pin will be raised for different conditions, such as pressure and temperature thresholds, finished ADC conversion, 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. Also, it 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 the development of safety devices in seawater, medical portable devices, disposable – drug treatment, mildly corrosive gases, liquid measurements, and more |
| On-board modules | MS5849-30BA - ultra-compact chlorine-resistant absolute pressure sensor from TE Connectivity                                                                                |
| Key Features     | High-resolution pressure sensor, fast                                                                                                                                       |

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|                  |                                                                                                                                                                                        |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | conversion, 24-bit ADC, built-in automatic conversion, signaling state by interrupt, programmable filter, built-in FIFO, wide operating pressure range, selectable interface, and more |
| Interface        | I2C,SPI                                                                                                                                                                                |
| Feature          | ClickID                                                                                                                                                                                |
| Compatibility    | mikroBUS™                                                                                                                                                                              |
| Click board size | M (42.9 x 25.4 mm)                                                                                                                                                                     |
| Input Voltage    | 3.3V                                                                                                                                                                                   |

## Pinout diagram

This table shows how the pinout on Pressure 23 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

| Notes                | Pin         |  |      |     |    | Pin        | Notes     |
|----------------------|-------------|-----------------------------------------------------------------------------------|------|-----|----|------------|-----------|
| ID SEL               | <b>RST</b>  | 1                                                                                 | AN   | PWM | 16 | NC         |           |
|                      | NC          | 2                                                                                 | RST  | INT | 15 | <b>INT</b> | Interrupt |
| SPI Select / ID COMM | <b>CS</b>   | 3                                                                                 | CS   | RX  | 14 | NC         |           |
| SPI Clock            | <b>SCK</b>  | 4                                                                                 | SCK  | TX  | 13 | NC         |           |
| SPI Data OUT         | <b>SDO</b>  | 5                                                                                 | MISO | SCL | 12 | <b>SCL</b> | I2C Clock |
| SPI Data IN          | <b>SDI</b>  | 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                                                                       |
| JP1     | ADDR SEL | Left    | I2C Address Selection<br>0/1: Left position 0,<br>Right position 1                        |
| JP2-JP6 | COMM SEL | Left    | Communication<br>Interface Selection<br>SPI/I2C: Left position<br>SPI, Right position I2C |

## Pressure 23 Click electrical specifications

| Description                   | Min  | Typ | Max  | Unit |
|-------------------------------|------|-----|------|------|
| Supply Voltage                | -    | 3.3 | -    | V    |
| Operating Pressure Range      | 300  | -   | 3000 | mbar |
| Relative Pressure Accuracy    | -0.5 | -   | 0.5  | mbar |
| Relative Temperature Accuracy | -2   | -   | 2    | °C   |
| ADC Resolution                | -    | 24  | -    | bit  |

## Software Support

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We provide a library for the Pressure 23 30BA Click as well as a demo application (example), 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 Pressure 23 30BA Click driver.

Key functions

- `pressure2330ba_get_measurement_data` Pressure 23 30BA gets the measurement data function.
- `pressure2330ba_get_calibration_data` Pressure 23 30BA gets the calibration data function.
- `pressure2330ba_read_adc` Pressure 23 30BA ADC data reading function.

## Example Description

This example demonstrates the use of Pressure 23 30BA 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), downloaded from our [LibStock™](#) or found on [MIKROE github account](#).

Other MIKROE Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Pressure2330BA

## 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. 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™](#)

[ClickID](#)

## Downloads

[MS5849-30BA datasheet](#)

[Pressure 23 click - 30BA 2D and 3D files v100](#)

[Pressure 23 Click - 30BA example on Libstock](#)

[Pressure 23 click - 30BA schematic v100](#)

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