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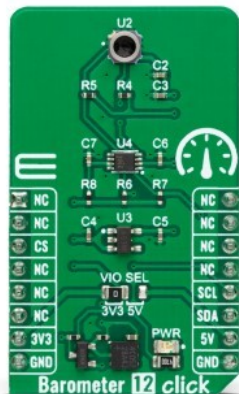www.mikroe.com

Barometer 12 Click

PID: MIKROE-5775

Barometer 12 Click is a compact add-on board that measures air pressure in a specific environment. This board features the ICP-10125, a high-accuracy, low-power, 10-atm waterproof barometric pressure and temperature sensor from TDK InvenSense. It has a normal pressure operating range from 95 to 105kPa (extended from 30 to 110kPa) and a maximum temperature operating range from -40 to 85°C. The sensor comes in a chimney package with waterproofing gel providing IPx8 waterproofing at 10atm. This Click board™ makes the perfect solution for the development of sports and fitness activity monitoring applications, altimeters, and barometers for portable devices, indoor/outdoor navigation, and more.

How does it work?

Barometer 12 Click is based on the ICP-10125, a high-accuracy, low-power, 10-atm waterproof barometric pressure and temperature sensor from TDK InvenSense. It is a very accurate sensor and can measure pressure differences with an accuracy of ±1 Pa, enabling altitude measurement differentials as small as 8.5 cm, less than the height of a single stair step. In addition to high accuracy, this sensor consumes only 1.3µA at 1Hz, making it ideal for battery-powered applications. According to the datasheet table, the sensor shows the best performance when operated with the recommended temperature and pressure range. The sensor works at 1.8V, which it gets from the AP2112, a CMOS LDO regulator from Diodes Incorporated.

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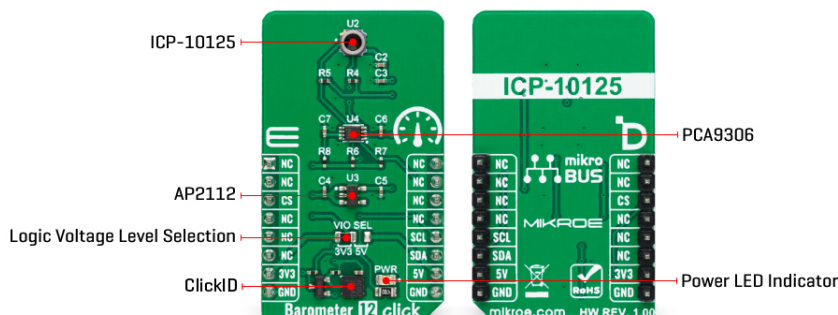
Barometer 12 Click uses a standard 2-Wire I2C interface to communicate with the host MCU supporting clock frequency up to 400KHz. To allow safe sensor operation on both 5V and 3.3V voltage logic, this Click board™ features the PCA9306, a dual bidirectional I2C bus and SMBus voltage-level translator from Texas Instruments.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VIO SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. This Click board™ comes equipped with a library containing easy-to-use 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 sports and fitness activity monitoring applications, altimeters, and barometers for portable devices, indoor/outdoor navigation, and more
On-board modules	ICP-10125 - barometric pressure and temperature sensor from TDK InvenSense
Key Features	Low power consumption, good relative pressure, and temperature accuracy, low noise, IPx8 waterproof to 10atm, small footprint, measure differentials of altitude as small as 8.5cm, ideal for battery-powered applications, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

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This table shows how the pinout on Barometer 12 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS		Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
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	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VIO SEL	Left	Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Barometer 12 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Pressure Operating Range	95	-	105	kPa
Pressure Absolute Accuracy	-	±1	-	hPa
Pressure Resolution	-	0.01	-	Pa

Software Support

We provide a library for the Barometer 12 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 Barometer 12 Click driver.

Key functions

- barometer12_inv_invpres_calib Barometer 12 inverse process data function.

- barometer12_get_raw_data Barometer 12 get RAW data function.

- barometer12_get_press_and_temp Barometer 12 get pressure and temperature function.

Example Description

This library contains API for the Barometer 12 Click driver. The library initializes and defines the I2C bus drivers to write and read data from registers. This demo application shows an example of
atmospheric pressure and temperature measurement.

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.Barometer12

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

mikroBUS™

mikroSDK

Click board™ Catalog

Click Boards™

ClickID

Downloads

PCA9306 datasheet

AP2112 datasheet

Barometer 12 click 2D and 3D files v100

Barometer 12 click schematic v100

ICP-10125 datasheet

Barometer 12 click example on Libstock