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Altitude 6 Click

PID: MIKROE-4903

Altitude 6 Click is a compact add-on board that allows height measurement of an object or point related to sea level or ground level. This board features the MS5611-01BA03, a high-resolution barometric pressure sensor optimized for altimeter applications with an altitude resolution of 10 cm from TE Connectivity. It consists of a high linearity pressure sensor and an ultra-low power 24 bit ΔΣ ADC with internal factory calibrated coefficients. Also, it provides a precise digital 24-bit pressure and temperature value, different operation modes, and a configurable host interface that supports both SPI and I2C serial communication allowing the user to optimize for conversion speed and current consumption. The high accuracy and stability of both pressure and temperature signal of the MS5611-01BA03 make this Click board™ suitable for height sensing in medical and consumer applications, indoor navigation, mobile altimeter or barometer systems, and many more.

Altitude 6 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?

Altitude 6 Click as its foundation uses the MS5611-01BA03-50, a high-resolution barometric pressure sensor optimized for altimeter applications with an altitude resolution of 10 cm from TE Connectivity. The MS5611-01BA03-50 consists of a piezo-resistive sensor with an integrated signal conditioning circuit that can measure pressure in a range from 10 mbar up to 1.2bar with an accuracy of 1.5 mbar over a wide operating temperature range at the lowest power consumption. The high accuracy and stability of both pressure and temperature signal make it suitable for height sensing in medical and consumer applications, mobile altimeter or

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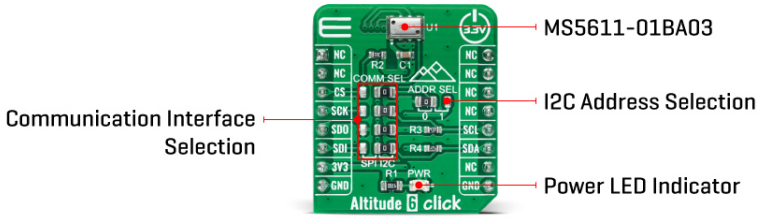
barometer systems, and many more.



The MS5611-01BA03-50 also has ultra-low-power 24-bit ΔΣ ADC with internal factory calibrated coefficients along with a high linearity pressure sensor. Its primary function is to convert the uncompensated analog output voltage from the piezo-resistive pressure sensor to a 24-bit digital value and provide a 24-bit digital value for the sensor's temperature, which allows the implementation of an altimeter function without any additional sensor.

Altitude 6 Click allows using both I2C and SPI interfaces with a maximum frequency of 20MHz. The selection can be made by positioning SMD jumpers labeled as COMM SEL to 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 MS5611-01BA03 allows choosing the least significant bit (LSB) of its I2C slave address using the SMD jumper labeled as ADDR SEL to an appropriate position marked as 0 and 1.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before use with 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 height sensing in medical and consumer applications, indoor navigation, mobile altimeter or barometer systems, and many more
On-board modules	MS5611-01BA03-50 - high-resolution barometric pressure sensor optimized for altimeter applications with an altitude resolution of 10 cm from TE Connectivity
Key Features	Low power consumption, high precision and resolution, integrated digital pressure sensor (24 bit ΔΣ ADC), excellent long-term stability, and many more
Interface	I2C,SPI

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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 Altitude 6 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
	NC	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
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-JP4	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP5	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Altitude 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Operating Pressure Range	10	-	1200	mbar
Accuracy	-	1.5	-	mbar
Resolution	-	24	-	bit
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Altitude 6 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

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account.

Library Description

This library contains API for Altitude 6 Click driver.

Key functions

- altitude6_get_data Altitude 6 get data function.
- altitude6_get_raw_data Altitude 6 get raw data function.
- altitude6_get_calibration_data Altitude 6 get calibration data function.

Example Description

This library contains API for Altitude 6 Click driver. The demo application reads and calculate temperature, pressure and altitude 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.Altitude6

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™

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Downloads

Altitude 6 click schematic

Altitude 6 click 2D and 3D files

Altitude 6 click example on Libstock

MS5611-01BA03 datashhet