MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Accel&Pressure Click

PID: MIKROE-6028

Accel&Pressure Click is a compact add-on board representing a rate-of-climb sensing solution for your application. This board features the FXLS8974CF, a 3-axis low-g accelerometer, and the MPL3115A2, a precision pressure sensor with altimetry, both from NXP Semiconductor. Those two sensors are high-performance, low-power devices covering all of Earth's surface elevations. By combining the acceleration and the barometric pressure data, you can easily determine the vertical velocity (the rate of climb) of the device on which the Accel&Pressure Click is integrated. This Click board™ makes the perfect solution for the development of vertical velocity applications and similar devices.

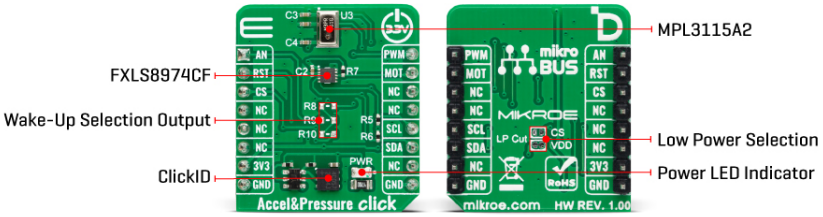
Accel&Pressure Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this Click board™ apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

Accel&Pressure Click is based on the FXLS8974CF, a 3-axis low-g accelerometer, and the MPL3115A2, a precision pressure sensor with altimetry, both from NXP Semiconductor. The accelerometer has a ±2/4/8/16 g user-selectable, full-scale measurement range with a 12-bit acceleration data output. It can work in several modes, such as active, hibernate, standby, and more. The integrated FIFO/LIFO buffer of 144 bytes can store 32 12-bit X/Y/Z/ data triplets. The sensor also has flexible data change detection, such as motion, freefall, and other inertial events. The pressure sensor has an absolute operating range of 20kPa to 110kPa in 20-bit measurements. Besides the pressure, the MPL3115A2 can also measure the altitude in a range

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

of -698 up to 11775 meters in a 20-bit resolution. It also comes with an embedded FIFO (32 samples) and up to 12 days of data logging using the FIFO. Both sensors have an integrated temperature sensor and are temperature-compensated.



Accel&Pressure Click uses a standard 2-wire I2C interface to allow the host MCU to communicate with both sensors. If the motion is detected, the FXLS8974CF uses a motion MOT pin to interrupt the host MCU. Depending on your application, you can choose one of the available pins (PWM, AN, CS) by soldering one of the jumpers (R8, R9, R10) to control the hibernation mode wake-up function of the FXLS8974CF. In addition, there are LP Cut jumpers at the bottom of the Accel&Pressure Click board™, with which a low power consumption feature can be achieved.

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	Motion,Pressure
Applications	Can be used for the development of vertical velocity applications and similar devices
On-board modules	FXLS8974CF - 3-axis low-g accelerometer from NXP Semiconductor MPL3115A2 - pressure sensor with altimetry from NXP Semiconductor
Key Features	User-selectable full-scale measurement ranges, high precision, FIFO buffers, flexible sensor data change detection function, wide absolute pressure operating range, altitude measurements, temperature compensation, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Input Voltage	3.3V

Pinout diagram

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

Notes	Pin	mikroBUS				Pin	Notes
Hibernation Mode Wake-Up	**AN**	1	AN	PWM	16	**PWM**	Hibernation Mode Wake-Up
ID SEL	**RST**	2	RST	INT	15	**MOT**	Motion Detection
Hibernation Mode Wake-Up / 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	NC	
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1-JP2	LP Cut	-	Low Power Consumption

Accel&Pressure Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Acceleration Measurement Range	±2	-	±16	g
Absolute Pressure Measurement Range	20	-	110	kPa
Altitude Measurement Range	-698	-	11775	m

Software Support

We provide a library for the AccelPressure 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 AccelPressure Click driver.

Key functions

- accelpressure_get_axes_data This function reads the accelerometer sensor axes data.

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

- accelpressure_get_pressure This function reads the sensor pressure data conversion in mbar.

- accelpressure_get_temperature This function reads the conversion of sensor pressure data in degrees Celsius.

Example Description

This library contains API for the AccelPressure Click driver. The library initializes and defines the I2C drivers to write and read data from registers, as well as the default configuration for the reading accelerator, pressure, and temperature data.

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.AccelPressure

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

FXLS8974CF datasheet

MPL3115A2 datasheet

MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Accel&Pressure click example on Libstock

Accel&Pressure click schematic

Accel&Pressure click 2D and 3D files