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 15 Click

PID: MIKROE-4501

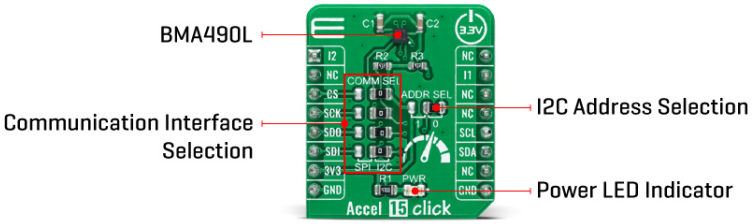
Accel 15 Click is a compact add-on board that contains a longevity acceleration sensor. This board features the BMA490L, a high-performance 16-bit digital triaxial acceleration sensor with extended availability of up to ten years from Bosch Sensortec. It allows selectable full-scale acceleration measurements in ranges of ±2g, ±4g, ±8g, and ±16g in three axes with a configurable host interface that supports both I2C and SPI serial communication and with intelligent on-chip motion-triggered interrupt features. Intelligent signal processing and evaluation in the accelerometer ASIC enables advanced gesture recognition for numerous industrial IoT applications where low power consumption is vital. This Click board™ is suitable for home appliances, power tools, and other industrial products whose lifetime is essential.

Accel 15 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?

Accel 15 Click as its foundation uses the BMA490L, a high-performance 16-bit digital triaxial longevity acceleration sensor with extended availability of up to ten years from Bosch Sensortec. The BMA490L is highly configurable with a programmable acceleration range of ±2/±4/±8/±16g, and intelligent on-chip motion-triggered interrupt features (any/no motion) optimized for industrial applications, routed to the INT and AN pins of the mikroBUS™ socket. In addition to all these features, it also has excellent temperature stability (low-temperature drift), low noise, and low offset.

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



The sensor features a high-performance measurement mode with low pass filters and current consumption of 150µA in Full-Operation Mode, making it robust to temperature fluctuations with a maximum output data rate of 1.6 kHz. In Low-Power Mode, the current consumption is reduced to 14 µA, meeting the current-consumption requirements of Always-On applications.

Accel 15 Click provides the possibility of using both I2C and SPI interfaces with a maximum frequency of 1MHz for I2C and 10MHz for SPI communication. 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 else the Click board™ may become unresponsive. While the I2C interface is selected, the BMA490L allows the choice of the least significant bit (LSB) of its I2C slave address using the SMD jumper labeled as ADDR SEL.

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	Motion
Applications	Can be used for home appliances, power tools, and other industrial products whose lifetime is essential.
On-board modules	BMA490L - high-performance 16-bit digital triaxial longevity acceleration sensor with extended availability of up to ten years from Bosch Sensortech
Key Features	Ultra-low power consumption, high performance, programmable functionality, on-chip interrupt features, adjustable bandwidth, optimized for industrial applications, and more
Interface	I2C,SPI
Feature	No ClickID
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 15 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Interrupt 2	**I2**	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	**INT**	Interrupt 1
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	ADDR SEL	Right	I2C Address Selection 0/1: Left position 0, Right position 1
JP2-JP5	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C

Accel 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Acceleration Range	±2		±16	g
Sensitivity	16384	-	2048	LSB/g
Bandwidth	0.75	-	800	Hz
Output Data Rate	12.5	-	1600	Hz
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Accel 15 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.

Library Description

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

This library contains API for Accel 15 Click driver.

Key functions:

- accel15_cfg_setup - Config Object Initialization function
- accel15_init - Initialization function.
- accel15_default_cfg - Click Default Configuration function.

Examples description

This library contains API for Accel 15 Click driver. The library initializes and defines the I2C or SPI bus drivers to write and read data from registers. The library also includes a function for reading X-axis, Y-axis, and Z-axis data.

The application is composed of three sections :

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.Accel15

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. The terminal available in all MikroElektronika compilers, or any other terminal application of your choice, can be used to read the message.

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

Accel 15 click 2D and 3D files

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

[BMA490L datasheet]

[Accel 15 click schematic]

[Accel 15 click example on Libstock]