

Accel 3 click



PID: MIKROE-2102

RS Product Code: [136-0797](#)

Accel 3 click carries the H3LIS331DL a low-power high-performance 3-axis linear accelerometer. The click is designed to run on a 3.3V power supply. It communicates with the target microcontroller over SPI or I2C interface, with additional functionality provided by the INT pin on the mikroBUS™ line.

H3LIS331DL features

The H3LIS331DL has dynamically user selectable full scales of $\pm 100g/\pm 200g/\pm 400g$ and it is capable of measuring accelerations with output data rates from 0.5 Hz to 1 kHz.

The “sleep-to-wakeup” function, in conjunction with low-power mode, allows to further reduce the system power consumption and develop new smart applications.

The H3LIS331DL may be set in a low-power operating mode, characterized by lower data rate refreshments. In this way the device, even if sleeping, continues to sense acceleration and generate interrupt requests.

When the “sleep-to-wakeup” function is activated, the H3LIS331DL is able to automatically wake up as soon as the interrupt event has been detected, increasing the output data rate and bandwidth.

SPI or I2C

Accel 3 click has three groups of jumpers (zero ohm resistors) on board:

The four jumpers on the left side of the board are for choosing between the SPI or I2C interface for the sensor output. By default, these are soldered into the I2C position.

On the right side of the board, the upper jumper is for specifying which of the two interrupt pins on H3LIS331DL will be connected to the mikroBUS™ pin.

The final jumper is for configuring the I2C address The I2C interface is compliant with both normal and fast modes (400 KHz), both common I2C standards.

Key features

- H3LIS331DL 3-axis linear accelerometer
- Ultra-low power consumption down to 10 µA in low-power mode
- ±100g/±200g/±400g dynamically selectable full scales
- Sleep-to-wakeup function
- SPI or I2C interface
- 3.3V power supply

Specification

Product Type	Motion
Applications	Shock detection, impact recognition, concussion detector
On-board modules	ST's H3LIS331DL low-power high-g 3-axis digital accelerometer
Key Features	16-bit data output; 0.5Hz to 1kHz data rates
Key Benefits	±100g/±200g/±400g dynamically selectable full scales
Interface	I2C or SPI
Power Supply	3.3V
Compatibility	mikroBUS
Click board size	S (28.6 x 25.4 mm)
Weight	20g

Features and usage notes

H3LIS331DL incorporates a sleep-to-wakeup function. In sleep mode the sensor is in a low-power operating mode; it continues to detect acceleration and generate interrupt requests, but with lower data rate refreshments. Once an interrupt threshold is sensed, the device automatically wakes up and increases the output data rate and bandwidth.

Pinout diagram

Notes	Pin	 mikroBUS™				Pin	Notes
		1	AN	PWM	16		
Not connected	NC	1	AN	PWM	16	NC	Not connected
Not connected	NC	2	RST	INT	15	INT	Inertial interrupt
SPI Chip Select	CS	3	CS	TX	14	NC	Not connected
SPI Clock	SCK	4	SCK	RX	13	NC	Not connected
SPI master in slave out	MISO	5	MISO	SCL	12	SCL	I2C Serial clock
SPI master out slave in	MOSI	6	MOSI	SDA	11	SDA	I2C Serial data
Power supply	+3.3V	7	3.3V	5V	10	NC	Not connected
Ground	GND	8	GND	GND	9	GND	Ground

This table shows how the pinout on Accel 3 click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

This snippet reads three axes' from the accelerometer every 30 milliseconds and displays them to UART. The values displayed have been calibrated and are measured in gs.

```
1 #include <stdint.h>
2 #include "accel3.h"
3
4 sbit ACCEL_3_CS at GPIO_ODR.B13;
5 sbit ACCEL_3_INT at GPIO_IDR.B10;
6
7 void main()
8 {
9     uint8_t address = 0x18;
10    xyz_t* my_coords;
11
12    //I2C
13    I2C1_Init_Advanced( 100000, &GPIO_MODULE_I2C1_PB67 );
14    Delay_ms(200);
15
16    //Accel 3 Initialization
17    accel3_init( address, accel_mode, d_rate, mode );
18
19    while(1)
20    {
21        my_coords = accel3_get_xyz();
22
23        sprintf( text, " x: %d y: %d z: %d ", my_coords->x_pos, my_coords->y_pos, my_coords->z_pos );
24        UART1_Write_Text( text );
25        UART1_Write_Text( "\r\n" );
26        Delay_ms(30);
27    }
28
29 }
```

Code examples that demonstrate the usage of Accel 3 click with MikroElektronika hardware, written for mikroC for ARM, AVR, dsPIC, FT90x, PIC and PIC32 are available on Libstock

Downloads

[LibStock: Accel 3 click library](#)

[Accel 3 click Schematic](#)

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[H3LIS331DL datasheet](#)