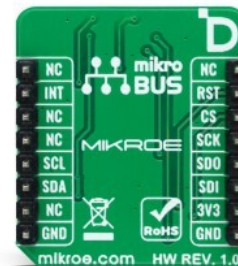


Accel 28 Click



PID: MIKROE-5737

Accel 28 Click is a compact add-on board that contains an acceleration sensor. This board features the [LIS2HH12TR](#), an ultra-low-power high-performance three-axis accelerometer from [STMicroelectronics](#). It allows selectable full-scale acceleration measurements in ranges of $\pm 2g$, $\pm 4g$, and $\pm 8g$ in three axes with a configurable host interface that supports both SPI and I2C serial communication. It has an integrated FIFO buffer that allows users to store data to limit the intervention by the host microcontroller. This Click board™ makes the perfect solution for various applications such as motion-activated functions and user interfaces, tap-double-tap recognition, free-fall detection, tracking, and many more.

How does it work?

Accel 28 Click is based on the LIS2HH12TR, an ultra-low-power high-performance three-axis accelerometer from STMicroelectronics. The sensing element is made of a suspended silicone structure anchored in a few points and free to move toward the sensed acceleration. If there is an acceleration, the proof mass is displaced from its normal position and causes an imbalance in the capacitive half-bridge, which is measured. The whole measurements are on the values of internal capacitors. The values are outputted as 16-bit data. The sensor features extreme robustness with 10000g of high shock survivability. It also has an embedded temperature sensor for temperature compensation and a self-test. The self-test capability allows the user to check the functioning of the sensor in the final application. The sensor is already factory calibrated.

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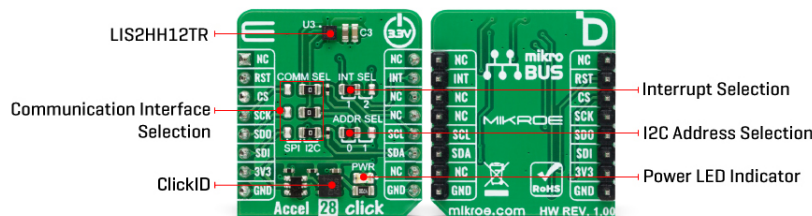
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The FIFO buffer of the LIS2HH12TR sensor works in several modes. Bypass mode bypasses the FIFO and is used to reset the FIFO when in FIFO mode. In FIFO mode, the sensor stores data from all three channels in the FIFO buffer. Stream mode provides continuous FIFO updates; the older data is discarded as new data arrives. There are additional modes Stream-to-FIFO, Bypass-to-Stream, Bypass-to-FIFO, Retrieving data from FIFO, and Burst. The Burst mode allows multiple reads to be performed.

Accel 28 Click allows using both I2C and SPI interfaces with a maximum frequency of 400KHz for I2C and 10MHz for SPI communication. The selection can be made by positioning SMD jumpers labeled as COMM SEL in 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 LIS2DTW12 allows choosing the least significant bit (LSB) of its I2C slave address using the SMD jumper labeled ADDR SEL. The Accel 28 also possesses two interrupt pins, both routed to the INT pin on the mikroBUS™ socket over the INT SEL jumper (default INT1). These interrupt pins signal MCU that an event has been sensed entirely programmed by the user through the I2C/SPI interface.

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. 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 various applications such as motion-activated functions and user interfaces, tap-double-tap recognition, free-fall detection, tracking, and many more
On-board modules	LIS2HH12TR - ultra-low-power high-performance three-axis accelerometer from STMicroelectronics
Key Features	Low power consumption, high performance and resolution, high reliability, FIFO storage, integrated interrupt features, selectable serial interface, embedded temperature sensor,

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	embedded self-test, and more
Interface	I2C,SPI
Feature	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 Accel 28 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	NC	
ID SEL	RST	2	RST	INT	15	INT	Interrupt
SPI Select / ID COMM	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-JP3	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP4	INT SEL	Left	Interrupt Channel Selection 1/2: Left position 1, Right position 2
JP5	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Accel 28 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Acceleration Range	±2	-	±8	g
Sensitivity	0.061	-	0.244	mg/digit
Resolution	-	16	-	bit

Software Support

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We provide a library for the Accel 28 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 Accel 28 Click driver.

Key functions

- accel28_get_data Accel 28 data reading function.
- accel28_write_reg Accel 28 register data writing function.
- accel28_sw_reset Accel 28 SW reset function.

Example Description

This example demonstrates the use of Accel 28 Click board™ by reading and displaying the accelerometer data (X, Y, and Z axis).

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.Accel28

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](#)

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[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Accel 28 click 2D and 3D files](#)

[LIS2HH12 datasheet](#)

[Accel 28 click example on Libstock](#)

[Accel 28 click schematic](#)

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