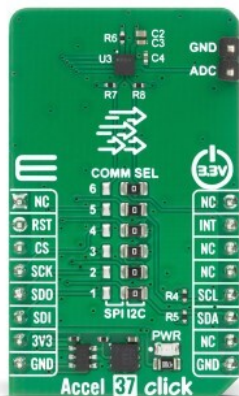


Accel 37 Click



PID: MIKROE-6945

Accel 37 Click is a compact add-on board designed for low-power 3-axis acceleration and motion sensing in always-on and battery-powered embedded applications. It is based on the [ADXL366](#), a micropower 3-axis $\pm 2g/\pm 4g/\pm 8g$ digital output MEMS accelerometer from [Analog Devices](#). It features ultra-low power operation, full-bandwidth sampling at all output data rates without aliasing from duty cycling, 14-bit output resolution with optional 12-bit and 8-bit formatted data, high sensitivity of 0.25mg/LSB in the $\pm 2g$ range, a configurable step counter, a deep multimode FIFO buffer, and an internal ADC for synchronous analog input conversion with interrupt capability. It also supports single-tap and double-tap detection, external clocking, synchronized sampling, and host MCU communication over SPI or I2C. This Click board is ideal for 24/7 sensing, hearing aids, vital signs monitoring devices, motion-enabled power-saving systems, smart watches, metering devices, and smart home applications.

For more information about **Accel 37 Click** visit the official [product page](#).

How does it work?

Accel 37 Click is based on the ADXL366, a micropower 3-axis digital output MEMS accelerometer from Analog Devices, offering selectable measurement ranges of $\pm 2g$, $\pm 4g$, and $\pm 8g$ for acceleration monitoring across a wide variety of use cases. This sensor stands out for its ultra-low power consumption, particularly at a 100Hz output data rate and in motion-triggered wake-up mode, making it an excellent choice for always-on sensing applications where power efficiency is critical. Unlike conventional low-power accelerometers that rely on duty cycling and risk aliasing due to under-sampling, the ADXL366 samples the full sensor bandwidth at all data rates, ensuring more accurate motion capture. The Accel 37 Click is well suited for 24/7 sensing, hearing aids, vital signs monitoring devices, motion-enabled power

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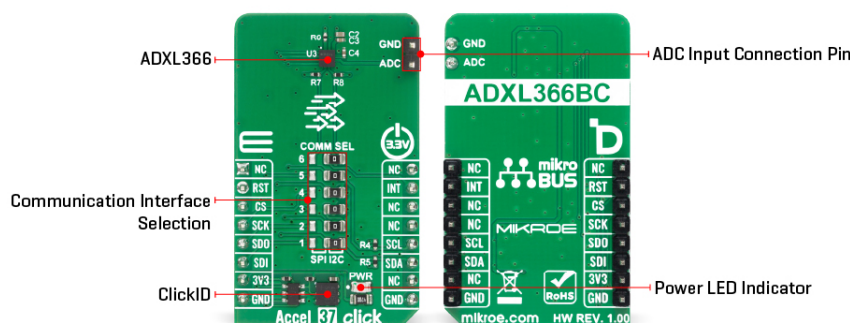


ISO 27001: 2013 certification of informational security management system.
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save switches, motion-enabled metering devices, single-cell smart watches, and smart home applications.



The ADXL366 provides 14-bit output resolution for detailed acceleration data, while also supporting 12-bit and 8-bit formatted output options for applications where reduced data size and single-byte transfers are preferred. With a sensitivity of 0.25mg/LSB in the $\pm 2g$ range, it enables highly accurate detection of even subtle movements. In addition to acceleration sensing, the ADXL366 integrates several features that contribute to overall power reduction and intelligent event detection, including a configurable step counter, a deep multimode FIFO buffer, a built-in micropower temperature sensor, and an internal analog-to-digital converter with interrupt capability for synchronous conversion of an analog input (the ADC pin). It also supports single-tap and double-tap detection at any output data rate and includes an internal state machine designed to reduce false triggering, improving reliability in real-world motion-sensitive systems. The device further allows external control of the sampling time and supports the use of an external clock, offering added design flexibility for specialized embedded applications.

This board supports communication with the host MCU through either SPI (maximum clock frequency of 8MHz) or I2C (maximum clock frequency of 400kHz) interfaces, with I2C being the default option. The communication interface is selected by adjusting the COMM SEL jumpers to the desired position. To ensure proper functionality, the first five COMM jumpers must be set to the same interface position, while the sixth jumper is used for interrupt selection, allowing one of the sensor's two interrupt outputs to be routed to the host MCU through the INT pin. These interrupts are used to notify the host MCU when activity or inactivity is detected, allowing the system to respond immediately without continuous polling and helping reduce overall power consumption. In addition, the interrupt pins provide extra functionality, with INT1 supporting external clock input and INT2 enabling synchronized sampling.

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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Specifications

Type	Motion
Applications	Ideal for 24/7 sensing, hearing aids, vital signs

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	monitoring devices, motion-enabled power-saving systems, smart watches, metering devices, and smart home applications
On-board modules	ADXL366 - micropower 3-axis $\pm 2g/\pm 4g/\pm 8g$ digital output MEMS accelerometer from Analog Devices
Key Features	Ultra-low power 3-axis MEMS acceleration sensing, selectable measurement ranges, full-bandwidth sampling at all output data rates, high sensitivity, configurable step counter, deep multimode FIFO buffer, built-in micropower temperature sensor, internal ADC for synchronous analog input conversion, interrupt capability, single-tap and double-tap detection, SPI and I2C interface compatibility, and more
Interface	I2C, SPI
Feature	ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Accel 37 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-JP6	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C

Accel 37 Click electrical specifications

Description	Min	Typ	Max	Unit
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Supply Voltage	-	3.3	-	V
Measurement Range	±2	-	±8	g
Resolution	-	14	-	bit
Sensitivity (±2g)	-	0.25	-	mg/LSB

Software Support

[Accel 37 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

Example Description

This example demonstrates the use of Accel 37 Click board by reading and displaying the accelerometer data (X, Y, and Z axis) and an internal temperature measurement in degrees Celsius.

Key Functions

- `accel37_cfg_setup` This function initializes Click configuration structure to initial values.
- `accel37_init` This function initializes all necessary pins and peripherals used for this Click board.
- `accel37_default_cfg` This function executes a default configuration of Accel 37 Click board.
- `accel37_get_accel` This function reads and converts the X, Y, Z acceleration data.
- `accel37_get_temp` This function reads and calculates the temperature value in Celsius.
- `accel37_get_temp` This function retrieves acceleration and temperature data from the device.

Application Init

Initializes the driver and performs the Click default configuration.

Application Task

Reads the accelerometer and temperature measurements. The results are displayed on the USB UART every 100 ms.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

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Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Accel 37 click example package](#)

[Accel 37 click 2D and 3D files v100](#)

[Accel 37 click schematic v100](#)

[ADXL366 datasheet](#)

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