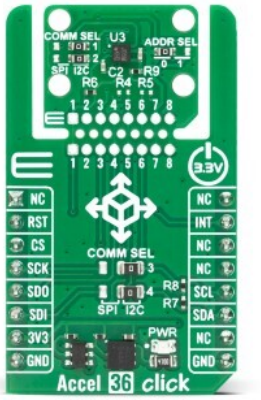
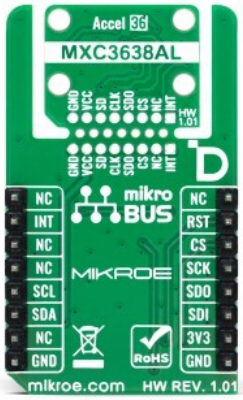
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Accel 36 Click





PID: MIKROE-6950

Accel 36 Click is a compact add-on board designed for automotive-grade 3-axis acceleration sensing, enabling motion, impact, orientation, and event detection. This board is based on the MXC3638AL, a 3-axis automotive-grade accelerometer from Memsic. Key features include ultra-low power operation, low-noise digital acceleration measurement, selectable ±2g, ±4g, ±8g, ±12g, and ±16g ranges, FIFO-supported 8-bit, 10-bit, or 12-bit resolution, 14-bit single samples, and a configurable internal sample rate from 14Hz to 1300Hz. The board supports SPI communication up to 8MHz or I2C up to 1MHz, a configurable interrupt for inertial and position-based events, and Click Snap support for detachable sensor placement. It is suitable for vehicle smart key systems, vehicle side door drive applications, motion detection, impact sensing, orientation monitoring, and wake-up detection.

For more information about **Accel 36 Click** visit the official product page.

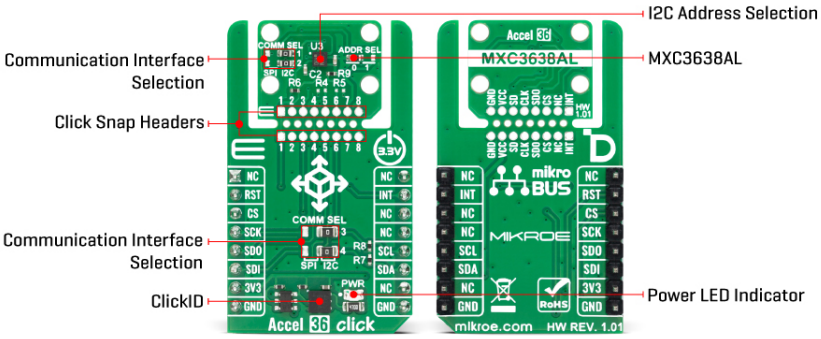
How does it work?

Accel 36 Click is based on the MXC3638AL, a 3-axis automotive-grade accelerometer from Memsic, designed for ultra-low power operation, low-noise performance, and integrated digital acceleration measurement. The MXC3638AL combines the MEMS sensing element and the electronics interface within a monolithic fabrication approach, helping reduce noise while maintaining efficient power consumption for applications where continuous or event-based motion monitoring is required. It supports selectable acceleration measurement ranges of ±2g, ±4g, ±8g, ±12g, and ±16g, and supports 8-bit, 10-bit, or 12-bit resolution when operating with FIFO data handling. Accel 36 Click is suitable for vehicle smart key systems, vehicle side door drive applications, motion detection, impact sensing, orientation monitoring, wake-up detection, and other automotive or industrial systems.

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This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the MXC3638AL can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

This board supports communication with the host MCU through either SPI (maximum clock frequency of 8MHz) or I2C (maximum clock frequency of 1MHz) interfaces, with I2C being the default option. The communication interface is selected by adjusting the COMM SEL jumper to the desired position. To enhance flexibility, particularly with the detachable Snap section of the Click Snap format, an additional COMM SEL jumpers are available. These jumpers function the same as the COMM SEL, allowing for independent communication interface selection when the Snap section is used independently.

To ensure proper functionality, all COMM jumpers must be set to the same interface. For those using the I2C interface, the board also provides an ADDR SEL jumper, enabling users to configure the I2C address as needed for their specific application. In addition to the interface pins, the board includes a configurable interrupt pin (INT) to trigger interrupt by detecting inertial events as well as by the position of the device itself.

Its internal sample rate can be configured from 14Hz up to 1300Hz, making it suitable for both low-frequency movement detection and faster dynamic acceleration events. Specific tap detection or sample acquisition conditions can be used to trigger an interrupt to a remote MCU, reducing the need for constant polling and helping optimize system-level power consumption. Alternatively, the host controller can read sample data and event status through polling, giving developers flexibility in how the accelerometer is integrated into the final application.

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.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring

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greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the official page dedicated to this feature.

Specifications

Type	Motion
Applications	Ideal for vehicle smart key systems, vehicle side door drive applications, motion detection, impact sensing, orientation monitoring, and wake-up detection
On-board modules	MXC3638AL - 3-axis automotive-grade accelerometer from Memsic
Key Features	Automotive-grade 3-axis acceleration sensing, ultra-low power operation, low-noise digital output measurement, monolithic MEMS and electronics integration, FIFO-supported 8-bit, 10-bit, and 12-bit resolution, configurable internal sample rate, tap detection interrupt support, sample acquisition interrupt support, event status polling support, interface selection, and more
Interface	I2C,SPI
Feature	Click Snap,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 36 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				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

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JP1-JP4	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP5	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

Accel 36 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Acceleration Range	±2	-	±16	g

Software Support

Accel 36 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 36 Click board by reading and displaying the accelerometer data (X, Y, and Z axis).

Key Functions

- accel36_cfg_setup This function initializes Click configuration structure to initial values.
- accel36_init This function initializes all necessary pins and peripherals used for this Click board.
- accel36_default_cfg This function executes a default configuration of Accel 36 Click board.
- accel36_set_fsr This function sets FSR by modifying bits[6:4] of Range and Resolution Control Register.
- accel36_set_odr This function sets the ODR by modifying bits[3:0] of Rate register 1.
- accel36_get_accel This function reads and converts the X, Y, Z acceleration data.

Application Init

Initializes the driver and performs the Click default configuration.

Application Task

Reads the accelerometer 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.

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- 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.

Resources

mikroBUS™

mikroSDK

Click board™ Catalog

Click boards™

ClickID

Downloads

Accel 36 click example package

Accel 36 click 2D and 3D files v101

Accel 36 click schematic v101

MXC3638AL datasheet

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