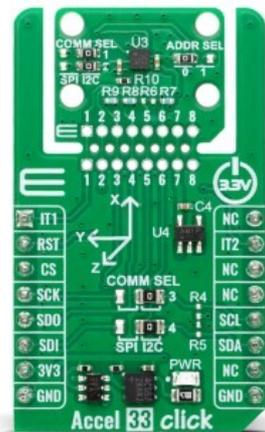


Accel 33 Click



PID: MIKROE-6629

Accel 33 Click is a compact add-on board designed for high-performance 3-axis acceleration measurement, enabling precise motion sensing in demanding industrial and automation applications. It is based on the [KX134ACR-LBZ](#) accelerometer from [ROHM Semiconductor](#), using proprietary Kionix™ MEMS technology for enhanced accuracy, stability, and durability. The device supports selectable full-scale ranges of $\pm 8g$, $\pm 16g$, $\pm 32g$, and $\pm 64g$, output data rates from 0.781Hz to 25.6kHz, and offers both low-power and high-resolution modes, along with an embedded FIFO buffer, digital high-pass filter, and factory-calibrated offset and sensitivity. The board features the innovative Click Snap format, allowing the main IC section to be detached for standalone use with independent interface selection, while supporting both SPI and I2C communication. Accel 33 Click is ideal for applications such as factory automation, industrial motors and pumps, robotics, and motion data logging where robust high-g performance is required.

For more information about **Accel 33 Click** visit the official [product page](#).

How does it work?

Accel 33 Click is based on the KX134ACR-LBZ, a high-performance 3-axis accelerometer from ROHM Semiconductor, based on a proprietary Kionix™ MEMS technology for precise and reliable motion sensing in demanding industrial applications. This advanced capacitive accelerometer integrates a proprietary plasma micromachining process combined with hermetic wafer-level bonding, ensuring exceptional durability and stability under varying environmental conditions. It supports selectable full-scale acceleration ranges of $\pm 8g$, $\pm 16g$, $\pm 32g$, and $\pm 64g$, with measurement based on the principle of differential capacitance

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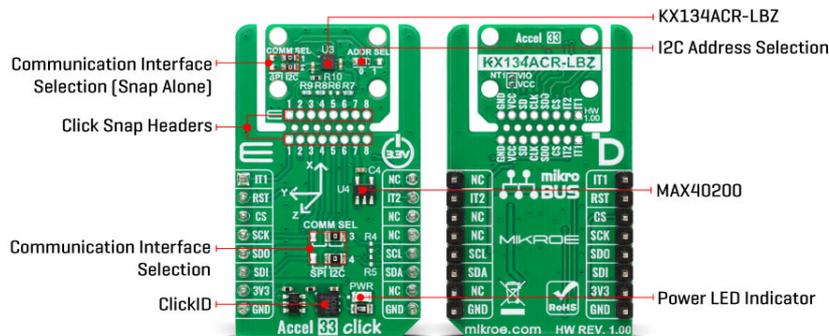


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generated by the acceleration-induced displacement of the sensing element, further enhanced by common-mode cancellation techniques to minimize errors caused by manufacturing variations, temperature changes, and environmental stress.



The device offers a flexible output data rate from 0.781Hz to 25.6kHz, with a choice between low-power and high-resolution modes to match performance and energy efficiency requirements, along with digital high-pass filter outputs for effective signal conditioning. An embedded FIFO buffer helps reduce host processor load, while a configurable low-power mode optimizes noise and power characteristics for long-term operation. Additional features include a factory-programmed offset and sensitivity calibration for consistent accuracy across devices. These capabilities make Accel 33 Click ideally suited for a range of applications such as factory automation equipment, industrial motors and pumps, robotic machines and arms, and motion data logging systems, delivering dependable high-g performance.

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 up many new possibilities for implementation. Thanks to the Snap feature, the KX134ACR-LBZ 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 10MHz) or I2C (maximum clock frequency of 400kHz) 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 functions 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 two configurable interrupt pins, IT1 and IT2, to trigger interrupts when accelerometer activity falls below a defined threshold window (Back-to-sleep) or exceeds a threshold window (Wake-up event). To manage the operation of the KX134ACR-LBZ IC, Accel 33 Click integrates the MAX40200 from Analog Devices that enables

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or disables the sensor through the RST pin.

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 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	Acceleration, Motion
Applications	Ideal for applications such as factory automation, industrial motors and pumps, robotics, and motion data logging
On-board modules	KX134ACR-LBZ - Kionix™ technology accelerometer IC from ROHM Semiconductor
Key Features	Selectable full-scale acceleration range and output data rates, low-power and high-resolution operating modes, embedded FIFO buffer, digital high-pass filter outputs, wake-up and back-to-sleep functionality, factory-programmed offset and sensitivity calibration, Click Snap, support for SPI and I2C communication interfaces, 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 33 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Interrupt 1	IT1	1	AN	PWM	16	NC	
Device Enable / ID SEL	RST	2	RST	INT	15	IT2	Interrupt 2
ID COMM	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	

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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	COMM SEL	Right	mikroBUS-Side Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C
JP3	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1
JP4-JP5	COMM SEL	Right	Snap-Side Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C

Accel 33 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Acceleration Range	±8	-	±64	g
Output Data Rate	0.781	-	25600	Hz

Software Support

[Accel 33 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 the Accel 33 Click board by periodically reading acceleration data from all three axes (X, Y, Z) and displaying the results on the UART terminal. It waits for the data ready interrupt before reading new data to ensure synchronization.

Key Functions

- `accel33_cfg_setup` This function initializes Click configuration structure to initial values.
- `accel33_init` This function initializes all necessary pins and peripherals used for this Click board.
- `accel33_default_cfg` This function executes a default configuration of Accel 33 Click board.
- `accel33_get_int2_pin` This function returns the logic state of the INT2 pin.
- `accel33_set_odr` This function sets the accelerometer's output data rate.
- `accel33_get_accel` This function reads and converts the raw acceleration data for all

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three axes.

Application Init

Initializes the logger and the Accel 33 Click driver, then sets up the default configuration.

Application Task

Waits for the data ready interrupt and reads acceleration values for the X, Y, and Z axes, then displays the values in g units via the UART terminal. The INT2 pin is used to signal when new data is ready to be read from the sensor.

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.

Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Accel 33 click example package](#)

[Accel 33 click 2D and 3D files v100](#)

[KX134ACR-LBZ datasheet](#)

[Accel 33 click schematic v100](#)

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