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Accel 24 Click

PID: MIKROE-5336

Accel 24 Click is a compact add-on board that contains an acceleration sensor. This board features the MXC6655XA, a 12-bit three-axis accelerometer from MEMSIC. It allows selectable full-scale acceleration measurements in ranges of ±2g, ±4g, or ±8g in three axes with a compatible I2C serial interface with 400kHz fast mode operation. Alongside low offset and temperature signal with high accuracy, the MXC6655XA also detects six orientation positions, X/Y shake, and shake directions with an appropriate interrupt signal for these states. This Click board™ is suitable for a wide range of information appliances, consumer electronics, household safety applications, and many more.

Accel 24 Click is supported by a mikroSDK compliant library, which includes functions that simplify software development. This Click board™ comes as a fully tested product, ready to be used on a system equipped with the mikroBUS™ socket.

How does it work?

Accel 24 Click is based on the MXC6655XA, a highly reliable digital triaxial acceleration from MEMSIC. The MXC6655XA is highly configurable with a programmable acceleration range of ±2g, ±4g, or ±8g based on MEMSIC's proprietary thermal technology built with a 0.18µm standard CMOS process. It contains no moving sensor parts, eliminating field reliability and repeatability issues; there is no measurable resonance (immunity to vibration), no stiction, and no detectable hysteresis.

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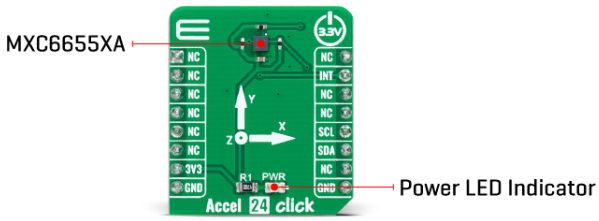

The MXC6655XA also eliminates the "click" sounds typically heard in ball-based orientation sensors. The MEMS structure is greater than 200,000g. This sensor provides X/Y/Z axis acceleration signals with a low 0g offset and temperature signals with high accuracy. In addition, it also detects six orientation positions, X/Y shake, and shakes directions.

Accel 24 Click communicates with an MCU using the standard I2C 2-Wire interface to read data and configure settings capable of operating in a standard or fast mode of operation. The acceleration signal is provided in 12-bit output resolution. In addition to communication pins, this board also possesses an additional interrupt pin, routed to the INT pin on the mikroBUS™ socket, for orientation and X/Y shake detections. The MXC6655XA allows users to be placed in a Power-Down mode enabled through the I2C 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 a wide range of information appliances, consumer electronics, household safety applications, and more
On-board modules	MXC6655XA - digital triaxial acceleration from MEMSIC
Key Features	Low power consumption, high performance and resolution, MEMS sensor with on-chip signal processing, no moving parts, 12-bit signal output for X, Y and Z axes, 6-position orientation detection, shake detection with interrupt, I2C interface, and more
Interface	I2C
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)

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Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Accel 24 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	
	NC	2	RST	INT	15	**INT**	Interrupt
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	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

Accel 24 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Acceleration Range	±2	-	±8	g
Acceleration Resolution	-	12	-	bits
Sensitivity (±2 ~ ±8)	256	-	1024	LSB/g
Operating Temperature Range	-40	+25	+85	°C

Software Support

We provide a library for the Accel 24 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

The 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 24 Click driver.

Key functions

- accel24_get_int_pin This function returns the INT pin logic state.
- accel24_read_data This function checks the data ready bit, clears it, and then reads the accel (X, Y, Z) and temperature measurements.

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- accel24_set_full_scale_range This function sets the full scale range resolution.

Example Description

This example demonstrates the use of Accel 24 Click board™ by reading and displaying accel data (X, Y, and Z axis) as well as temperature measurements on the USB UART.

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.Accel24

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 MikroElektronika compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MikroElektronika 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

Click board™ Catalog

Click Boards™

Downloads

Accel 24 click example on Libstock

MXC6655XA datasheet

Accel 24 click 2D and 3D files

Accel 24 click schematic