MIKROELEKTRONIKA D.O.O, Batajnički drum 23, 11000 Belgrade, Serbia
VAT: SR105917343 Registration No. 20490918
Phone: + 381 11 78 57 600 Fax: + 381 11 63 09 644 E-mail: office@mikroe.com
www.mikroe.com

Tilt 4 Click

PID: MIKROE-6026

Tilt 4 Click is a compact add-on board designed for reliable tilt detection applications. This board features the RB-231X2, a rolling ball tilt switch from C&K Components, ensuring accurate and safe tilt detection. The RB-231X2 features a compact, shielded design with a detection angle of up to 10° and an operating life of 100,000 cycles. It interfaces with the MCU using only the INT and LED pins, providing real-time interrupt signals and visual tilt indication through a red LED. This Click board™ supports both 3.3V and 5V logic levels, making it versatile for various MCU applications. Ideal for movement detection, safety devices, white goods, and consumer electronics, Tilt 4 Click is a dependable solution for diverse tilt detection needs.

How does it work?

Tilt 4 Click is based on the RB-231X2, a rolling ball tilt switch from C&K Switches (Littelfuse) specially designed for safety control. This switch features a compact, shielded design that allows an angle of detection up to 10°. The conductive ball inside the tube moves to generate the signal and contact. The RB-231X2 offers an impressive operating life of 100,000 cycles, with key specifications including a single-pole single-throw (SPST) contact arrangement, a sensor angle range from 0˚ to 10˚, and dimensions of 9.7 mm in height, 16.6 mm in length, and 5.0 mm in width. It is ideal for movement detection, safety devices, white goods, and consumer electronic applications.

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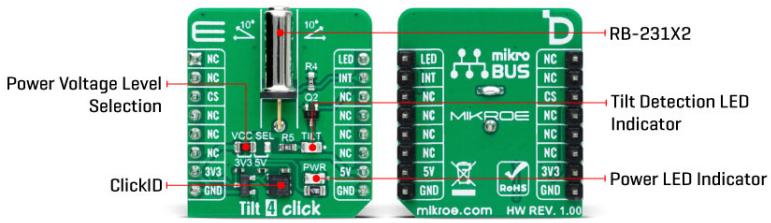

Tilt 4 Click interfaces with the MCU using only two pins: INT and LED pins of the mikroBUS™ socket. The INT pin is an interrupt signal, immediately alerting the MCU upon detecting a tilt event, ensuring prompt response and processing. Meanwhile, the LED pin controls the TILT red LED, which provides a clear visual indication whenever a tilt is detected. This dual-pin configuration simplifies the connection process and enhances the efficiency and reliability of tilt detection and indication. The INT pin's role in delivering real-time interrupt signals is crucial for applications requiring immediate action, while the LED pin's control over the TILT red LED ensures that the status of the tilt detection is always visible, making it easier to monitor and debug.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	Motion
Applications	Ideal for movement detection, safety devices, white goods, and consumer electronics
On-board modules	RB-231X2 - rolling ball tilt switch from C&K Switches (Littelfuse)
Key Features	High-quality rolling ball tilt switch, compact and shielded design, detection angle up to 10°, operating life of 100,000 cycles, interrupt signal and LED for visual tilt indication, supports both 3.3V and 5V logic levels, and more
Interface	GPIO
Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

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Pinout diagram

This table shows how the pinout on Tilt 4 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	**LED**	Tilt LED Control
	NC	2	RST	INT	15	**INT**	Tilt Interrupt
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
LD2	TILT	-	Tilt Detection LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Tilt 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Tilt Detection Angle	0	-	10	deg

Software Support

We provide a library for the Tilt 4 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 Tilt 4 Click driver.

Key functions

- tilt4_read_int_state This function reads the state of the interrupt pin of Tilt 4 click board.
- tilt4_set_led_state This function sets the LED pin on the selected level level of Tilt 4 click board.

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Example Description

This example demonstrates the use of Tilt 4 Click board™.

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.Tilt4

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

Click board™ Catalog

Click boards™

ClickID

Downloads

Tilt 4 Click example on Libstock

Tilt 4 Click 2D and 3D files v100

RB-231X2 Datasheet

Tilt 4 Click schematic v100

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