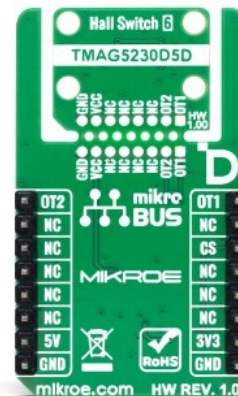
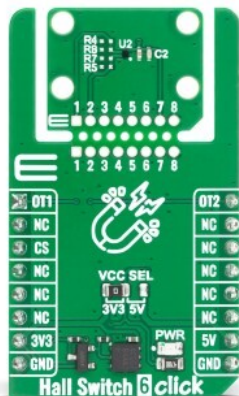


Hall Switch 6 Click



PID: MIKROE-7005

Hall Switch 6 Click is a compact add-on board designed for low-power magnetic presence, position, and movement detection in space-constrained embedded applications. This board is based on the [TMAG5230D5D](#), a low-power Z-axis Hall-effect switch from [Texas Instruments](#). Key features include magnetic flux density detection perpendicular to the sensor package, a typical operating point of 2.4mT, a typical release point of 2mT, dual-unipolar magnetic detection, and a 20Hz sample rate. As a dual-unipolar switch, it provides two independent outputs routed to the OT1 and OT2 pins of the mikroBUS™ socket, allowing the host MCU to detect positive and negative magnetic field directions separately. The Click Snap format also allows the main sensor area to be separated and positioned independently. This Click board™ is suitable for tablets, smartphones, notebook computers, earbuds, AR/VR glasses, digital still cameras, and other compact systems requiring non-contact magnetic switching.

For more information about **Hall Switch 6 Click** visit the official [product page](#).

How does it work?

Hall Switch 6 Click is based on the TMAG5230D5D, a low-power Z-axis Hall-effect switch from Texas Instruments. The TMAG5230D5D detects magnetic flux density perpendicular to the sensor package and provides digital output signals when the magnetic operating and release thresholds are crossed. With a typical operating point of 2.4mT and a typical release point of 2mT, this sensor is suitable for detecting the presence, position, or movement of a magnet in space-constrained and battery-powered applications. Since a magnet produces a three-dimensional magnetic field whose strength and direction vary depending on the magnet position and orientation, this Click board™ can be used for magnetic presence and position detection in applications such as tablets, smartphones, notebook computers, earbuds, AR/VR

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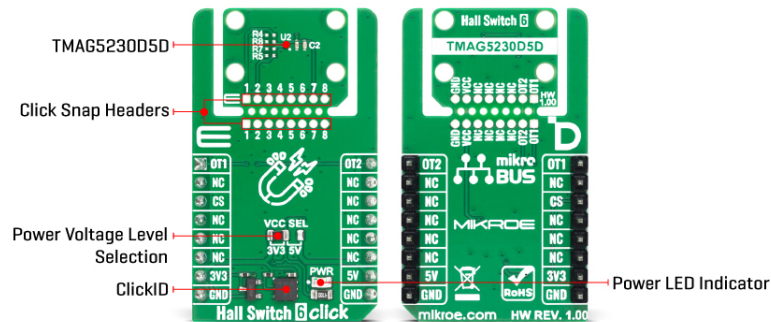


ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).

glasses, digital still cameras, and other compact electronic systems requiring non-contact magnetic switching.



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 TMAG5230D5D 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.

The TMAG5230D5D operates as a dual-unipolar Hall-effect switch, meaning that its two digital outputs respond to opposite magnetic field directions. Magnetic flux density traveling from the bottom to the top of the package is considered positive, while magnetic flux density traveling from the top to the bottom of the package is considered negative. In this configuration, the OUT1 pin responds to positive magnetic flux density through the package, while the OUT2 pin responds to negative magnetic flux density through the package. On Hall Switch 6 Click, these two outputs are routed to the OT1 and OT2 pins of the mikroBUS™ socket, allowing the host MCU to independently detect magnetic field polarity changes through simple digital input monitoring.

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.

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	Magnetic
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Applications	Ideal for tablets, smartphones, notebook computers, earbuds, AR/VR glasses, digital still cameras, and other compact systems requiring non-contact magnetic switching
On-board modules	TMAG5230D5D - low-power Z-axis Hall-Effect switch from Texas Instruments
Key Features	Low-power Z-axis Hall-effect switch, magnetic flux density detection perpendicular to the sensor package, dual-unipolar magnetic detection, positive and negative magnetic field direction sensing, push-pull active-low digital outputs, independent magnetic polarity detection, Click Snap, and more
Interface	GPIO
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Hall Switch 6 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Switch Output 1	OT1	1	AN	PWM	16	OT2	Switch Output 2
	NC	2	RST	INT	15	NC	
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
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Hall Switch 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Magnetic Operating Point	-	2.4	-	mT
Magnetic Release Point	-	2	-	mT

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Sample Rate	-	20	-	Hz
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Software Support

[Hall Switch 6 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 Hall Switch 6 Click board by detecting which magnetic pole is present near the TMAG5230D5D sensor and logging the result via UART.

Key Functions

- `hallswitch6_cfg_setup` This function initializes Click configuration structure to initial values.
- `hallswitch6_init` This function initializes all necessary pins and peripherals used for this Click board.
- `hallswitch6_get_out1_pin` This function reads the state of the OUT1 pin, which goes LOW when positive flux exceeds the BOP threshold.
- `hallswitch6_get_out2_pin` This function reads the state of the OUT2 pin, which goes LOW when negative flux exceeds the BOP threshold.
- `hallswitch6_get_pole` This function reads both output pins and returns which magnetic pole is currently detected, if any.

Application Init

Initializes the logger and the Hall Switch 6 Click driver.

Application Task

Reads both sensor outputs every 100 ms and logs the detected magnetic pole state. A message is logged only when the state changes.

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™](#)

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[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Hall Switch 6 click example package](#)

[Hall Switch 6 click 2D and 3D files v100](#)

[Hall Switch 6 click schematic v100](#)

[TMAG5230D5D datasheet](#)

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