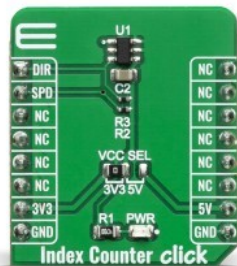


# Index Counter Click



PID: MIKROE-4005

**Index Counter Click** is a simple prototyping high precision Hall-Effect switch solution with direction detection. This board is hosting [TLE4966K](#) an integrated circuit dual Hall-effect sensor from [Infineon](#). The sensor is designed specifically for highly accurate applications which use a rotating pole wheel since offers high sensitivity and high stability of the magnetic switching points. Since this sensor is based on two hall probes that provide information about direction and speed of the moving wheel, this makes this product excellent choice for applications such as index counting, rotational speed and direction applications, motor driven position systems.

Index Counter 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?

The Index Counter Click is based around the TLE4966K, which is a high sensitivity and high stability of the magnetic switching points sensor with reverse battery protection (-18 V). This sensor has many features that make it a perfect solution for small designs such as the Index Counter Click board™. One of these features is certainly its high level of integration that allows a minimal number of external components.

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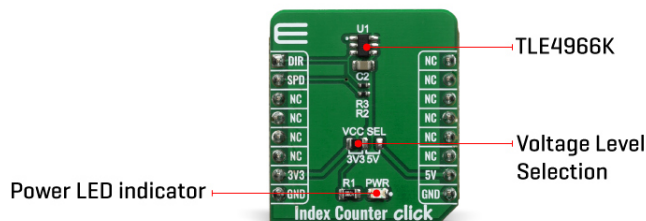
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ISO 9001: 2015 certification of quality management system (QMS).



The TLE4966K provides excellent temperature compensation capability for keeping the output stable under changing temperature. It is designed specifically for highly accurate applications with a speed signal for every magnetic pole pair, as well as direction information. The TLE4966 Hall Sensors feature two integrated and calibrated sensor elements for detecting direction and counting indexes. This feature eliminates the need for a second sensor and cuts engineering and production costs. Using just one sensor also raises system quality and reliability.

The chopped Double Hall Switch comprises two Hall probes, bias generator, compensation circuits, oscillator, and output transistors.

The bias generator provides currents for the Hall probes and the active circuits. Compensation circuits stabilize the temperature behavior and reduce technology variations.

The Active Error Compensation rejects offsets in signal stages and the influence of mechanical stress to the Hall probes caused by molding and soldering processes and other thermal stresses in the package. This chopper technique together with the threshold generator and the comparator ensures high accurate magnetic switching points.

## Specifications

Type	Magnetic
Applications	Index Counter Click is excellent choice for applications such as index counting, rotational speed and direction applications, motor driven position systems.
On-board modules	TLE4966K, an integrated circuit double Hall-effect sensor
Key Features	High sensitivity and high stability of the magnetic switching points, reverse battery protection (-18 V), superior temperature stability
Interface	GPIO
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)

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Input Voltage	3.3V or 5V
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## Pinout diagram

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

Notes	Pin					Pin	Notes
Direction	<b>DIR</b>	1	AN	PWM	16	NC	
Speed	<b>SPD</b>	2	RST	INT	15	NC	
	NC	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	<b>3.3V</b>	7	3.3V	5V	10	<b>5V</b>	Power Supply
Ground	<b>GND</b>	8	GND	GND	9	<b>GND</b>	Ground

## Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Power supply voltage selection: left position 3V3, right position 5V

## Software Support

We provide a library for the Index Counter Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

## Library Description

The library covers all the necessary functions to control Index Counter click board. The library contains a function that shows the status of the pins - direction and speed.

Key functions:

- uint8\_t indexcounter\_get\_dir ( void ) - Get state of the direction pin function.
- uint8\_t indexcounter\_get\_speed ( void ) - Get state of the speed pin function.

## Examples description

The application is composed of three sections :

- System Initialization - Initializes GPIO, sets DIR ( AN ) and SPD ( RST ) pins as input and begins to write a log.
- Application Initialization - Initialization driver enables - GPIO, performs a control of the timer counter ( resolution of 1ms ) and sets the value of the timer counter, starting

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- timer and number of pairs of rotating poles, also write log.
- Application Task - (code snippet) This is an example which demonstrates the use of the Index Counter click board. This example shows the direction of movement, Rotations Per Minute ( RPM or speed ) of the three pairs of rotating poles positioned in the sensor operating range. Results are being sent to the Usart Terminal where you can track their changes.
- void log\_display ( float rpm\_val ) - The function displays all results and a float value with a comma with two decimal places.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- GPIO
- UART

## 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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

## 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

[Index Counter click schematic](#)

[Index Counter click example on Libstock](#)

[TLE4966K-DS datasheet](#)

[Index Counter click 2D and 3D files](#)

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