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Opto Encoder 5 Click

PID: MIKROE-6056

Opto Encoder 5 Click is a compact add-on board that offers non-contact switching with unparalleled accuracy and precision. This board features the OPB666N, a Photologic® slotted optical switch from TT Electronics, ensuring top-notch performance and reliability. It integrates an 890nm infrared LED and a monolithic integrated circuit with a photodiode, linear amplifier, and Schmitt trigger, all powered effectively by a 5V supply from the mikroBUS™ power rail. The board features an NPN open-collector output configuration and is TTI/LST TL compatible, highlighting its ease of use and versatility. With the ability to operate on both 3.3V and 5V logic levels, it caters to a wide range of microcontrollers. Its applications are diverse, suitable for replacing mechanical switches, serving as a speed indicator, mechanical limit indicator, and edge sensing in sectors demanding high precision and reliability.

Opto Encoder 5 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets this Click board™ apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

How does it work?

Opto Encoder 5 Click is based on the OPB666N, a Photologic® slotted optical switch from TT Electronics. This device integrates an infrared light-emitting diode (LED) operating at 890nm alongside a monolithic integrated circuit. It also combines a photodiode, a linear amplifier, and a Schmitt trigger all on one silicon chip. It operates effectively with a 5V power supply from the 5V mikroBUS™ power rail. It also features an NPN open-collector output configuration accessible through the OUT pin on the mikroBUS™ socket and the ON pin for enabling the

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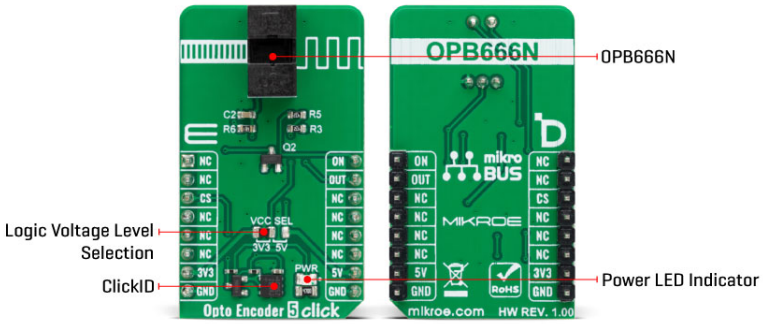
optical switch. In addition, compatibility with TTI/LST TL is assured. This Click board™ finds its application in various domains, such as replacing mechanical switches, serving as a speed indicator (tachometer), mechanical limit indicator, and edge sensing, thanks to its swift response times and real-time detection capability.



The OPB666N is an optical sensor designed to make significant impacts across various sectors, pushing the boundaries of optical sensing technology. Its superior capabilities, coupled with a design that emphasizes compactness and durability, make it incredibly versatile. Its slim profile makes its incorporation into areas where space is at a premium, while its robust build guarantees consistent performance in even the most challenging environments. It is designed to resist extreme temperatures, vibrations, and moisture and is the ideal choice for rigorous industrial applications. The high-resolution optics of the OPB666N assure unmatched accuracy and precision. Thanks to the onboard optical switch, the OPB666N, this Click board™ offers numerous advantages, including non-contact switching, improved signal-to-noise ratio, and employs a through-beam sensing technique.

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	Optical
Applications	Ideal for replacing mechanical switches, serving as a speed indicator, mechanical limit indicator, and edge sensing in sectors demanding high precision and reliability
On-board modules	OPB666N - Photologic® slotted optical switch from TT Electronics
Key Features	Non-contact switching, enhanced signal-to-noise ration, sensing method through-beam, TTI/LST TL compatible, exceptional performance, ideal for demanding industrial environments, fast response time, and more
Interface	GPIO

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ClickID	Yes
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 Opto Encoder 5 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	**ON**	Sensor Enable
	NC	2	RST	INT	15	**OUT**	Output Data
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	Logic Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Opto Encoder 5 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Wavelength	-	890	-	nm

Software Support

We provide a library for the Opto Encoder 5 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 Opto Encoder 5 Click driver.

Key functions

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- optoencoder5_enable This function enables the slotted optical switch of Opto Encoder 5 click board.
- optoencoder5_disable This function disables the slotted optical switch of Opto Encoder 5 click board.
- optoencoder5_get_out_state This function detecting slotted optical switch states of Opto Encoder 5 click board.

Example Description

This example demonstrates the use of the Opto Encoder 5 Click board by detecting eclipse states.

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.OptoEncoder5

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™

Downloads

Opto Encoder 5 click example on Libstock

Opto Encoder 5 click schematic v100

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Opto Encoder 5 click 2D and 3D files v100

OPB666N datasheet