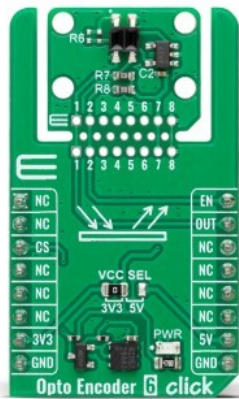


## Opto Encoder 6 Click



PID: MIKROE-6569

**Opto Encoder 6 Click** is a compact add-on board for precise motion and position detection. This board features the [ATIR0721DS](#), a transmissive photointerrupter from [Kingbright](#), ensuring high sensitivity and reliable performance. This slotted optical switch detects object movement by interrupting the light beam, with a visible light cut-off design to minimize ambient light interference. Additionally, it integrates the MAX40200 from Analog Devices, which enables or disables the photointerrupter through the EN pin, optimizing power efficiency and operational flexibility, and a Click Snap feature for flexible implementation. The output signal is accessible via the OUT pin, allowing its integration into various control and monitoring systems. Opto Encoder 6 Click is ideal for applications like motor speed monitoring, position tracking in automation systems, and other industrial and consumer electronics requiring precise motion sensing.

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

### How does it work?

Opto Encoder 6 Click is based on the ATIR0721DS, a transmissive photointerrupter from Kingbright, designed to offer high sensitivity and reliable performance, making it well-suited for various microcomputerized control systems. The ATIR0721DS operates as a slotted optical switch, where an object passing through the sensing slot interrupts the light beam, generating a precise output signal. Additionally, the device is designed as a visible light cut-off type, ensuring enhanced immunity to ambient light interference and providing a stable detection mechanism in different lighting conditions. Thanks to its compact design, the Opto Encoder 6 Click is an excellent choice for implementations where space-saving and reliable detection are crucial.

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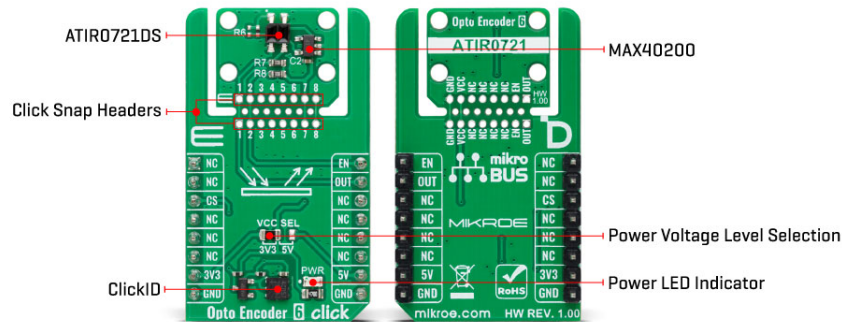
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ISO 27001: 2013 certification of informational security management system.  
 ISO 14001: 2015 certification of environmental management system.  
 OHSAS 18001: 2008 certification of occupational health and safety management system.



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



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 area to become movable by breaking the PCB, opening up many new possibilities for implementation. Thanks to the Snap feature, the ATIR0721DS 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.

To manage the operation of the ATIR0721DS photointerrupter, Opto Encoder 6 Click integrates the MAX40200 from Analog Devices that enables or disables the photointerrupter through the EN pin. This setup allows precise control over the photointerrupter's functionality, optimizing power efficiency and operational flexibility. The output signal from the photointerrupter is available via the OUT pin on the board, allowing integration into various applications that require motion or position tracking.

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, introducing a new level of flexibility and ease of use. This feature allows for easy detachment of the main sensor area by simply snapping the PCB along designated lines, enabling various implementation possibilities. For detailed information about Click Snap, please visit the [official page](#) dedicated to this feature.

## Specifications

Type	Optical
Applications	Ideal for applications like motor speed monitoring, position tracking in automation systems, and various microcomputerized control systems
On-board modules	ATIR0721DS - transmissive photointerrupter

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	from Kingbright
Key Features	Slotted optical switch for precise motion detection, visible light cut-off design for enhanced ambient light immunity, high sensitivity, Click Snap feature, 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 Opto Encoder 6 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	<b>EN</b>	Photointerrupter Enable
	NC	2	RST	INT	15	<b>OUT</b>	Photointerrupter Output
ID COMM	<b>CS</b>	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 Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

## Opto Encoder 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Sensing Distance	-	-	1.8	mm

## Software Support

[Opto Encoder 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

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This example demonstrates the use of Opto Encoder 6 Click board by processing the encoder output pin state and incrementing the step counter on falling edge.

## Key Functions

- `optoencoder6_cfg_setup` This function initializes Click configuration structure to initial values.
- `optoencoder6_init` This function initializes all necessary pins and peripherals used for this Click board.
- `optoencoder6_enable_output` This function enables output by setting the EN pin to high logic state.
- `optoencoder6_disable_output` This function disables output by setting the EN pin to low logic state.
- `optoencoder6_get_out_pin` This function returns the OUT pin logic state.

## Application Init

Initializes the driver and logger, and enables the encoder output.

## Application Task

Increments the step counter on falling edge of the encoder output pin state and displays it on the USB UART.

## 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™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

## Downloads

### [Opto Encoder 6 click 2D and 3D files v100](#)

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[Opto Encoder 6 click example package](#)

[ATIR0721DS datasheet](#)

[Opto Encoder 6 click schematic v100](#)

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