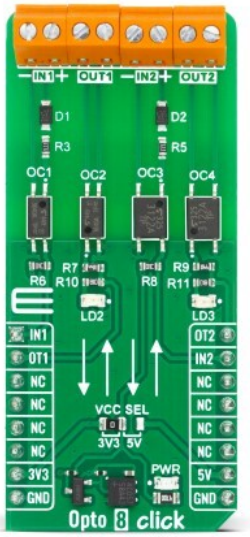
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Opto 8 Click





PID: MIKROE-6928

Opto 8 Click is a compact add-on board designed for isolated load switching up to 1.4A, serving as a solid-state alternative to mechanical relays and providing dependable galvanic isolation in embedded applications. This board is based on the TLP3640A and TLP3122A, infrared LED optically coupled photo-MOSFET photorelays from Toshiba Semiconductor. Key features include two different normally open 1-Form-A photorelay channels, simple digital control through IN1/OT1 and IN2/OT2 pins, LD2 and LD3 indicator LEDs for output state feedback, up to 1A ON-state current for the TLP3640A channel, up to 1.4A ON-state current for the TLP3122A channel, low ON-state resistance, and 3750Vrms minimum isolation voltage. Opto 8 Click is suitable for factory automation, PLCs, security systems, measuring instruments, automatic test equipment, non-automotive battery management systems, and compact mechanical relay replacement applications.

For more information about **Opto 8 Click** visit the official product page.

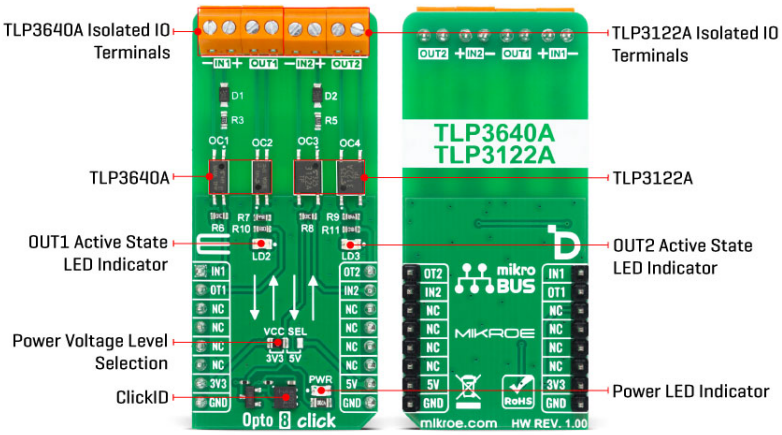
How does it work?

Opto 8 Click is based on the TLP3640A and TLP3122A, infrared LED optically coupled photo-MOSFET photorelays from Toshiba Semiconductor. The board combines two different normally open 1-Form-A photorelay channels, allowing users to evaluate and implement two isolated switching paths on a single Click board™. The left side of the board is dedicated to the TLP3640A channel, with the IN1 and OT1 pins used for control, while the LD2 indicator LED provides visual feedback when the OUT1 terminal of the TLP3640A is active. The second channel follows the same functional configuration for the TLP3122A, using the IN2 and OT2 pins for control and the LD3 red indicator LED to signal the active state of the OUT2 terminal. The board communicates with the target MCU through simple digital control lines routed to the

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mikroBUS™ socket, making it easy to integrate into embedded systems where galvanic isolation, compact relay replacement, and dependable high-current switching are required.



The TLP3640A consists of an infrared LED optically coupled to a photo-MOSFET in an SO4 package and is suitable for high-current ON/OFF control thanks to its higher output current capability compared to phototransistor-type photocouplers. It supports a trigger LED current of 3mA maximum, an ON-state current of up to 1A, an ON-state resistance of 0.3Ω maximum, and an isolation voltage of 3750Vrms minimum. The TLP3122A consists of an infrared LED optically coupled to a photo-MOSFET in a 4-pin SO6 package and provides a higher ON-state current of up to 1.4A, an ON-state resistance of 0.25Ω maximum, a trigger LED current of 3mA maximum, and an isolation voltage of 3750Vrms minimum.

By combining these two Toshiba photorelays, Opto 8 Click offers a practical solid-state alternative to mechanical relays, with fast, silent, and electrically isolated switching suitable for factory automation, programmable logic controllers, security systems, measuring instruments, automatic test equipment, non-automotive battery management systems, and other embedded applications that require reliable isolated load control.

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	Optocoupler
Applications	Ideal for factory automation, PLCs, security systems, measuring instruments, automatic test equipment, non-automotive battery management systems, and compact mechanical relay replacement applications
On-board modules	TLP3640A, TLP3122A - infrared LED optically coupled to a photo-MOSFET from Toshiba Semiconductor
Key Features	Two normally open 1-Form-A photorelay channels, infrared LED optically coupled photo-

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	MOSFET photorelays, isolated high-current ON/OFF switching, solid-state mechanical relay replacement, output state indicator LEDs, simple digital control through the mikroBUS™ socket, and more
Interface	GPIO
Feature	ClickID
Compatibility	mikroBUS™
Click board size	L (57.15 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Opto 8 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
TLP3640A Input Control	**IN1**	1	AN	PWM	16	**OT2**	TLP3122A Output Control
TLP3640A Output Control	**OT1**	2	RST	INT	15	**IN2**	TLP3122A Input Control
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	LD2	-	OUT1 Active State LED Indicator
LD3	LD3	-	OUT2 Active State LED Indicator
JP1	VCC SEL	Left	Power Voltage Level Selection 3V3/5V: Left position 3V3, Right position 5V

Opto 8 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
ON-State Current, TLP3640A Channel	-	-	1	A
ON-State Resistance, TLP3640A Channel	-	-	0.3	Ω
ON-State Current, TLP3122A Channel	-	-	1.4	A
ON-State Resistance, TLP3122A Channel	-	-	0.25	Ω

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Isolation Voltage	3750	-	-	Vrms

Software Support

Opto 8 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 Opto 8 Click board by monitoring the state of opto-isolated inputs and controlling the corresponding outputs. When an input state changes, the application updates the related output and logs the new state to the serial terminal.

Key Functions

- opto8_cfg_setup This function initializes Click configuration structure to initial values.
- opto8_init This function initializes all necessary pins and peripherals used for this Click board.
- opto8_default_cfg This function executes a default configuration of Opto 8 Click board.
- opto8_set_out1 This function sets the output 1 control pin to high logic state.
- opto8_clear_out1 This function clears the output 1 control pin to low logic state.
- opto8_get_in1 This function reads the input 1 status pin logic state.

Application Init

Initializes the logger and Opto 8 Click driver and configures the digital input and output pins through the mikroBUS socket.

Application Task

Continuously reads the states of the opto-isolated inputs and updates the corresponding outputs when a change is detected, logging the output state to the serial terminal.

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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Opto 8 click example package

Opto 8 click 2D and 3D files v100

Opto 8 click schematic v100

TLP3640A datasheet

TLP3122A datasheet

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