

IR 2 Click



PID: MIKROE-5088

IR 2 Click is a compact add-on board representing a compact and easy solution for adding infrared (IR) remote control to your design. This board features the TSOP98638, a miniaturized sensor for receiving the modulated signal of QEE113 IR emitting diode from Vishay Semiconductors. This IR sensor module consists of a photodetector, pre-amplifier, and automatic gain control to surpass ambient noise with signals transmitted to it in the near-infrared range with a wavelength of 940nm. It also communicates with the target MCU via selectable GPIO lines. This Click board™ is suitable for IR repeater applications that improve your system and allow you more flexibility, sensitivity, and longer receiving range.

IR 2 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?

IR 2 Click as its foundation uses the TSOP98638, a miniaturized sensor for receiving the modulated signal of QEE113 IR emitting diode from Vishay Semiconductors. All Vishay IR receivers have the same circuit architecture consisting of a photodetector, pre-amplifier, and automatic gain control (ACG) to surpass ambient noise with signals transmitted to it with a wavelength of 940nm. This Click board™ represents a compact and easy solution for adding infrared (IR) remote control to your design suitable for IR repeater applications.

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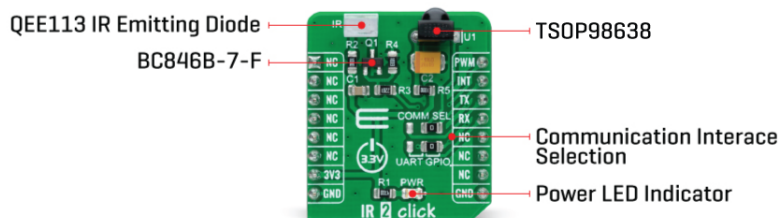
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The infrared signal generates an equivalent photocurrent in the integrated photo PIN diode. The DC part of the signal is blocked in the bias circuit, and the AC part is passed to a trans impedance amplifier, followed by an automatic gain-control amplifier and an integrated bandpass filter. A comparator, an integrator, and a Schmitt Trigger stage perform the final signal conditioning. The blocks “Automatic Gain Control” and “Automatic Threshold Control” dynamically control the operating points and the threshold levels required to suppress noise from disturbance sources. The digital output signal has an active-low polarity and consists of an incoming optical burst envelope signal without the carrier frequency.

IR 2 Click communicates with the target MCU via selectable GPIO lines. The selection can be made by positioning SMD jumpers labeled as COMM SEL to an appropriate position. The default configuration of this Click board™ allows transmission via PWM pin of the mikroBUS™ socket and reception via INT pin, while the other configuration allows communication using TX and RX pins.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used, as a reference, for further development.

Specifications

Type	Optical
Applications	Can be used for IR repeater applications
On-board modules	TSOP98638 - miniaturized sensor for receiving the modulated signal of IR emitting diode from Vishay Semiconductors
Key Features	Photo detector and preamplifier in one package, AGC to suppress ambient noise, improved shielding againsts electric field disturbance, high sensitivity, long receiving range, flexibility, low power consumption, and more
Interface	GPIO,PWM,UART
Feature	No ClickID

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Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on IR 2 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
	NC	1	AN	PWM	16	PWM	Transmit Signal
	NC	2	RST	INT	15	INT	Receive Signal
	NC	3	CS	RX	14	TX	Transmit Signal
	NC	4	SCK	TX	13	RX	Transmit Signal
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
Power Supply	3.3V	7	3.3V	5V	10	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1-JP2	COMM SEL	Right	Communication Interface Selection UART/GPIO: Left position UART, Right position GPIO

IR 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
IR Wavelength	-	940	-	nm
Carrier Frequency	-	38	-	kHz
Operating Temperature Range	-25	+25	+85	°C

Software Support

We provide a library for the IR 2 Click as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Library Description

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This library contains API for IR 2 Click driver.

Key functions

- `ir2_get_out_pin` This function returns the OUT pin logic state.
- `ir2_nec_send_data` This function sends an address and data bytes using NEC protocol.
- `ir2_nec_read_data` This function reads an address and data bytes by using NEC protocol.

Example Description

This example demonstrates the use of an IR 2 click board by showing the communication between the two click boards configured as a receiver and transmitter using the NEC protocol.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager(recommended way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.IR2

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 MikroElektronika [compilers](#).

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

[IR 2 click example on Libstock](#)

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[QEE113 datasheet](#)

[IR 2 click 2D and 3D files](#)

[IR 2 click schematic](#)

[TSOP98638 datasheet](#)

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