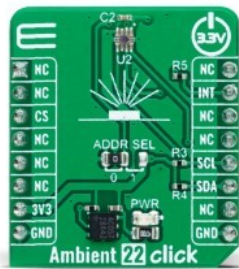


## Ambient 22 Click



PID: MIKROE-5647

**Ambient 22 Click** is a compact add-on board that measures the intensity of visible light. This board features the [OPT3005](#), a single-chip lux meter from [Texas Instruments](#) that transforms light intensity to a digital signal output that can be directly communicated via an I2C interface. The sensor's spectral response tightly matches the human eye's photopic response along with extreme rejection to 850nm and 940nm infrared light over a wide angle of incidence. Measurements can be made from 20mlux up to 166klux without manually selecting full-scale ranges using the built-in, full-scale setting feature. This Click board™ is suitable for obtaining ambient light data in applications like display optical-intensity, industrial, or commercial lighting control.

Ambient 22 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?

Ambient 22 Click is based on the OPT3005, a single-chip lux meter from Texas Instruments, measuring light intensity as visible by the human eye. The device's precision spectral response and extreme IR rejection enable the OPT3005 to accurately meter light intensity as seen by the human eye regardless of the light source and any stray light from 850nm or 940nm active illumination. The IR rejection also helps to maintain high accuracy when this board is mounted under dark glass, especially with active 850nm or 940nm NIR illumination. This board is designed for applications that create light-based experiences for humans and is a preferred replacement for photodiodes, photoresistors, or other ambient light sensors with less human eye matching and IR rejection.

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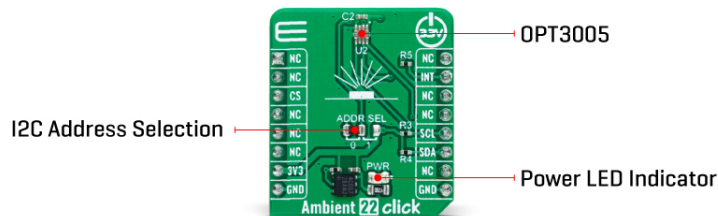
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The OPT3005 measures 20mlux up to 166klux over a 23-bit effective dynamic range. It can be configured into an automatic full-scale, range-setting mode that always selects the best full-scale range setting for the lighting conditions. This mode frees the user from having to program their software for potential iterative measurement cycles and readjustment of the full-scale range until optimal for any given measurement. The OPT3005 can also operate continuously or in single-shot measurement modes.

Ambient 22 Click communicates with an MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting High-Speed mode. Also, the OPT3005 allows choosing the least significant bits (LSB) of its I2C slave address using the SMD jumper labeled ADDR SEL. It also possesses an additional interrupt signal, routed on the INT pin of the mikroBUS™ socket, indicating when a specific interrupt event occurs, such as detecting a meaningful change in light intensity.

This Click board™ can only be operated 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 obtaining ambient light data in applications like display optical-intensity, industrial, or commercial lighting control
On-board modules	OPT3005 - single-chip lux meter from Texas Instruments
Key Features	Low power consumption, precision optical filtering to match human eye, corresponds to a dark window because of high sensitivity, I2C interface, wide and flexible operational range, effective dynamic range with automatic gain ranging, and more
Interface	I2C
Feature	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 Ambient 22 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	NC	
	NC	2	RST	INT	15	<b>INT</b>	Interrupt
	NC	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	<b>SCL</b>	I2C Clock
	NC	6	MOSI	SDA	11	<b>SDA</b>	I2C Data
Power Supply	<b>3.3V</b>	7	3.3V	5V	10	NC	
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	ADDR SEL	Left	I2C Address Selection 0/1: Left position 0, Right position 1

## Ambient 22 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Spectral Range	-	-	167	klux
Wavelength	850/940			nm

## Software Support

We provide a library for the Ambient 22 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 Ambient 22 Click driver.

## Key functions

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- `ambient22_get_int_pin` This function returns the INT pin logic state.
- `ambient22_read_lux` This function checks for a conversion ready flag bit and then reads the ambient light level in lux.
- `ambient22_write_register` This function writes a desired data to the selected register by using I2C serial interface.

## Example Description

This example demonstrates the use of Ambient 22 Click board™ by measuring the ambient light level in lux.

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.Ambient22

## 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, which needs to be downloaded from the [LibStock](#) and installed for the compiler you are using to ensure proper operation of [mikroSDK](#) compliant Click board™ demo applications.

For more information about mikroSDK, visit the [official page](#).

## Resources

[mikroBUS™](#)

[mikroSDK](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

## Downloads

[Ambient 22 click example on Libstock](#)

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[Ambient 22 click 2D and 3D files](#)

[OPT3005 datasheet](#)

[Ambient 22 click schematic](#)

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