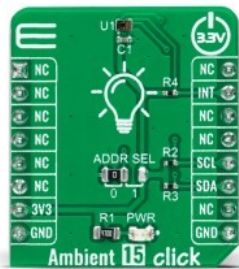


## Ambient 15 Click



PID: MIKROE-4967

**Ambient 15 Click** is a compact add-on board used to measure the amount of the present ambient light. This board features the TSL2584TSV, a very-high sensitivity light-to-digital converter with an I2C interface that transforms light intensity into a digital output signal from AMS-AG. The TSL2584TSV's near-photopic response produces a highly accurate lux measurement up to 33klx even when mounted behind dark glass. Filtering out unwanted IR light enables the sensor to measure the ambient light more accurately, thus producing a near-photopic response. It is designed to control the brightness in various applications based on ambient light availability, brightness for optimum visibility, and energy efficiency. Operation in a temperature range of  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  ensures stable operation under extreme conditions. This Click board™ is the most suitable for obtaining ambient light data for adjusting brightness in applications that require power saving and better visibility.

Ambient 15 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 15 Click as its foundation uses the TSL2584TSV, a high sensitivity light-to-digital converter that transforms light intensity into a digital output signal from AMS-AG. Thanks to its near-photopic response, the TSL2584TSV can detect a wide range of highly accurate lux measurements up to 33klx, even when mounted behind dark glass. Filtering out unwanted IR light enables the sensor to accurately measure the ambient light, thus producing a near-photopic response. It also has stable performance over a wide temperature range of  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ , suitable for measuring the present ambient light.

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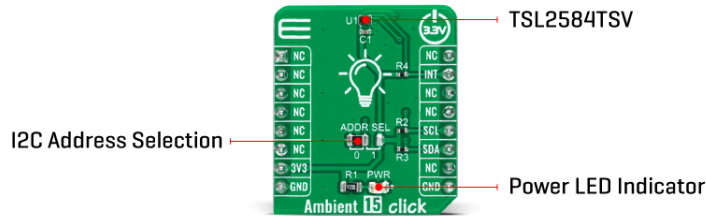
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The TSL2584TSV combines one broadband photodiode (visible plus infrared), one infrared-responding photodiode, and, as mentioned before, a photopic infrared-blocking filter on a single CMOS integrated circuit. Two integrating analog-to-digital converters (ADC) convert the photodiode currents into a digital output representing the irradiance measured on each channel. Integration of both channels occurs simultaneously. Upon completion of the conversion cycle, the conversion result is transferred to the Channel 0 and Channel 1 data registers. The transfers are double-buffered to ensure that the integrity of the data is maintained. After the transfer, the device automatically begins the next integration cycle.

Ambient 15 Click communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Standard Mode operation with a clock frequency of 100kHz and Fast Mode up to 400kHz. Besides, the TSL2584TSV allows choosing the least significant bit (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 labeled as INT, indicating when a specific interrupt event occurs, such as detecting a meaningful change in light intensity.

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 obtaining ambient light data for adjusting brightness in applications that require power saving and better visibility
On-board modules	TSL2584TSV - high sensitivity light-to-digital converter that transforms light intensity into a digital output signal from AMS-AG
Key Features	Low power consumption, corresponds to a dark window because of high sensitivity, close responsivity to the human eye, I2C interface with selectable slave address, wide illumination range, stable performance over

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	temperature, and more
Interface	I2C
Feature	No ClickID
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 15 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 15 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Illuminance Measurement Range	0	-	33.000	lx
Operating Temperature Range	-40	+25	+85	°C

## Software Support

We provide a library for the Ambient 15 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 Ambient 15 Click driver.

#### Key functions

- `ambient15_set_atime` This function sets the timing register for the selected integration time.
- `ambient15_set_gain` This function sets the gain level.
- `ambient15_measure_light_level` This function reads the raw ADC data from two channels and then measures the light level in lux based on those readings.

#### Example Description

This example demonstrates the use of Ambient 15 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 way), downloaded from our [LibStock™](#) or found on [Mikroe github account](#).

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.Ambient15

#### 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

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[TSL2584TSV datasheet](#)

[Ambient 15 click 2D and 3D files](#)

[Ambient 15 click schematic](#)

[Ambient 15 click example on Libstock](#)

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