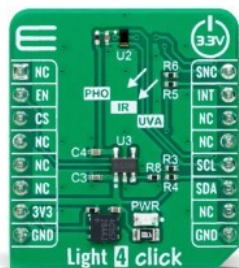


Light 4 Click



PID: MIKROE-6105

Light 4 Click is a compact add-on board designed for precise ambient light, UV index, and light flicker detection. This board features the TSL2585 sensor from ams OSRAM, which incorporates photopic, infrared (IR), and ultraviolet (UV) photodiodes to enable multiple concurrent sensing functions. The TSL2585 continuously monitors ambient light, calculates irradiance, and detects light flicker using optimized filters and dedicated IR and UV channels. It communicates with the host MCU via a standard I2C interface, includes interrupt-driven events for threshold-based alerts, and operates with 3.3V logic voltage. Light 4 Click is ideal for applications such as automatic display brightness management, environmental UV monitoring, and camera assistance for exposure and flicker detection.

How does it work?

Light 4 Click is based on the TSL2585, an ambient light sensor with UV and light flicker detection capabilities from ams OSRAM. This sensor's unique architecture incorporates photopic, infrared (IR), and ultraviolet (UV) photodiodes, enabling it to perform multiple sensing functions concurrently. Applications of Light 4 Click include automatic display brightness management in changing light conditions, UV index estimation for environmental monitoring, and camera assistance for auto exposure and flicker detection. This versatility makes it an excellent choice for consumer electronics, outdoor applications, and camera systems that require precise light and UV sensing.

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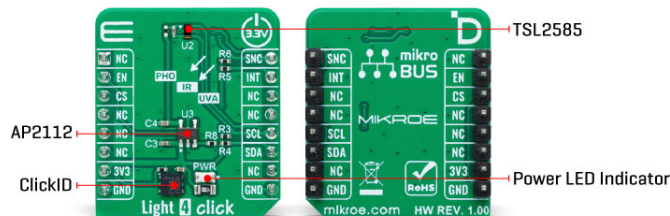
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The TSL2585's innovative design ensures it can continuously monitor ambient light levels under any glass type. Additionally, its flicker detection functionality operates parallel with ambient light sensing, using the same photodiodes to capture data for calculating flicker frequencies. The sensor buffers this data, allowing a host MCU to process and detect flicker from various light sources. Its photopic photodiode is equipped with an optimized filter that mimics the human eye's response to visible light, while a dedicated IR channel allows for accurate ambient light measurement and irradiance calculation of various light sources. Moreover, the UV photodiode is fitted with a band-pass UV filter, which, combined with the photopic and IR channels, allows for the estimation of the ambient UV index. An external MCU running specialized algorithms can further process this information to provide real-time UV index readings.

This Click board™ uses a standard 2-wire I2C interface to communicate with the host MCU, supporting Standard mode with up to 400kHz of frequency clock. It also provides interrupt-driven events through the INT pin on the mikroBUS™ socket, triggered when ALS results exceed or fall below user-configured threshold levels. The SNC pin on the mikroBUS™ socket serves a dual-purpose function. It can be used as a synchronization input, allowing the sensor to align its measurements with external events or signals, ensuring accurate timing and coordination in applications that require precise synchronization. Alternatively, it can also function as a general-purpose open-drain input/output pin, providing additional flexibility for various control or signaling tasks, depending on the application's specific requirements.

The TSL2585 does not require a specific Power-Up sequence but requires a voltage of 1.8V for its interface and logic part to work correctly. Therefore, a small regulating LDO, the [AP2112](#), provides a 1.8V out of 3.3V mikroBUS™ power rail.

This Click board™ can be operated only with a 3.3V logic voltage level and activated via the EN pin of the mikroBUS™ socket, providing a power-enabling function. The board must perform appropriate logic voltage level conversion before using MCUs with different logic levels. Also, it 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	Ideal for automatic display brightness management, environmental UV monitoring,

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	and camera assistance for exposure and flicker detection
On-board modules	TSL2585 - ambient light sensor with UV and light flicker detection from ams OSRAM
Key Features	Simultaneous sensing functions for ambient light, UV index estimation, and flicker detection, optimized photopic filter, band-pass UV filter for accurate UV index estimation, IR channel for irradiance calculation, flicker detection engine, I2C interface, interrupt-driven events for user-configured ALS thresholds, and more
Interface	I2C
Feature	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 Light 4 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	SNC	Synchronization / GPIO
Device Enable	EN	2	RST	INT	15	INT	Interrupt
ID COMM	CS	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	SCL	I2C Clock
	NC	6	MOSI	SDA	11	SDA	I2C Data
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

Light 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Spectral Responsivity (PH/UVA/IR)	560/350/880			nm
ALS Gain Ration	0.5	-	4096	x

Software Support

We provide a library for the Light 4 Click as well as a demo application (example), developed using MIKROE [compilers](#). The demo can run on all the main MIKROE [development boards](#).

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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 Light 4 Click driver.

Key functions

- `light4_write_reg` This function writes a byte into the selected register by using I2C serial interface.
- `light4_sw_reset` This function is used to perform software reset of Light 4 click board.
- `light4_read_channel_data` This function is used to read data from selected channel of Light 4 click board.

Example Description

This example demonstrates the use of Light 4 Click 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.Light4

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. 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](#)

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[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Light 4 click example on Libstock](#)

[Light 4 click 2D and 3D files v100](#)

[TSL2585 datasheet](#)

[Light 4 click schematic v100](#)

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