

# Ambient 14 Click



PID: MIKROE-6255

Ambient 14 Click is a compact add-on board for ambient light and proximity detection applications. This board features the TMD2755, an advanced sensor from ams OSRAM, which combines ambient light sensing (ALS) and proximity detection in a single, compact module. The TMD2755 features an integrated infrared VCSEL and driver and a proximity engine that includes offset adjustment and ambient light subtraction for enhanced accuracy. It provides 16-bit data output for ALS and proximity detection, allowing precise control of backlight brightness in devices. This Click board™ communicates via the I2C interface, supports interrupt-driven events, and operates on 1.8V logic voltage, with built-in level shifting for compatibility with 3.3V and 5V systems. Ambient 14 Click is ideal for applications in mobile devices, smart displays, and other electronics requiring accurate light and proximity sensing.

## How does it work?

Ambient 14 Click is based on the TMD2755, an advanced sensor from ams OSRAM that combines digital ambient light sensing (ALS) and proximity detection in a highly compact 1.1mm module. The TMD2755 integrates an infrared VCSEL (Vertical-Cavity Surface-Emitting Laser) and a factory-calibrated VCSEL driver for efficient proximity detection. This sensor excels in detecting objects, such as recognizing the proximity of a user's ear to a mobile device screen, by measuring the reflected IR energy emitted by the integrated VCSEL. The board's proximity detection capabilities are supported by a sophisticated proximity engine, which includes an offset adjustment feature to eliminate unwanted reflections from nearby objects, enhancing accuracy. It also improves proximity measurements by automatically subtracting ambient light interference. The results from both ALS and proximity detection are provided as 16-bit data, enabling precise measurement of ambient light levels for tasks like adjusting display backlight brightness.

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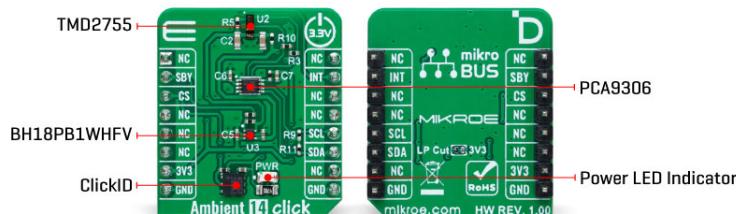
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This Click board™ uses a standard 2-wire I2C interface to communicate with the host MCU, supporting Standard mode with up to 1MHz of frequency clock. It also provides interrupt-driven detect/release events through the INT pin on the mikroBUS™ socket. These interrupts are triggered when proximity results exceed or fall below user-configured threshold levels.

The TMD2755 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 [BH18PB1WHFV](#), provides a 1.8V out of 3.3V mikroBUS™ power rail. Since the sensor operates on 1.8V, this Click board™ also features the [PCA9306](#) voltage-level translator, allowing the TMD2755 to work properly with 3.3V and 5V MCU. This regulator can be activated via the SBY pin of the mikroBUS™ socket, providing an enable function simultaneously.

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. 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	Ambient Light, Optical, Proximity
Applications	Ideal for applications in mobile devices, smart displays, and other electronics requiring accurate light and proximity sensing
On-board modules	TMD2755 - ambient light sensing (ALS) and proximity detection sensor from ams OSRAM
Key Features	Ambient light and proximity detection capability, integrated IR VCSEL and factory-calibrated VCSEL driver, 16-bit data output, proximity engine, interrupt-driven detect/release events, I2C interface, and more
Interface	I2C
Feature	ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)

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Input Voltage

3.3V

## Pinout diagram

This table shows how the pinout on Ambient 14 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	
Device Enable	<b>SBY</b>	2	RST	INT	15	<b>INT</b>	Interrupt
ID COMM	<b>CS</b>	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

## Ambient 14 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Spectral Response (ALS/IR)	580/920			nm

## Software Support

We provide a library for the Ambient 14 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 14 Click driver.

### Key functions

- `ambient14_read_proximity` This function reads the raw proximity data. The higher the value, the closer the detected object is.
- `ambient14_read_als_ir` This function reads the raw ALS and IR data.
- `ambient14_get_illuminance` This function calculates the illuminance level (Lux) from ALS data counts input.

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## Example Description

This example demonstrates the use of Ambient 14 Click by measuring the illuminance level (Lux) and the proximity data on the USB UART.

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.Ambient14

## 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](#)

[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

## Downloads

[Ambient 14 click example on Libstock](#)

[Ambient 14 click 2D and 3D files v100](#)

[TMD2755 datasheet](#)

[Ambient 14 click schematic v100](#)

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