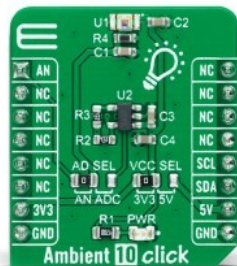


# Ambient 10 Click



PID: MIKROE-4777

**Ambient 10 Click** is a compact add-on board used to sense the amount of the present ambient light. This board features the APDS-9006-020, analog-output ambient light photosensor from Broadcom Limited. It consists of a spectrally suited photosensor, which provides excellent responsivity that is close to the response of the human eyes. Besides, it is also characterized by good output linearity across a wide illumination range, low sensitivity variation across various light sources, and comes with the ability to process the output signal in analog or digital form. 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 10 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 10 Click as its foundation uses the APDS-9006-020, analog-output ambient light photo sensor from Broadcom Limited. It consists of a photosensor whose spectral response is close to CIE standard photopic observer. Hence, it provides an excellent responsivity that is close to the response of human eyes. It has stable performance over a wide temperature and voltage range. It is characterized by good output linearity across a wide illumination range and low sensitivity variation across various light sources suitable to sense the amount of the present ambient light.

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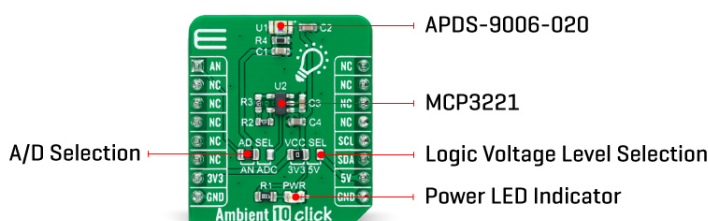
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The analog output signal of the APDS-9006-020 can be converted to a digital value using MCP3221, a successive approximation A/D converter with a 12-bit resolution from Microchip, using a 2-wire I2C compatible interface, or can be sent directly to an analog pin of the mikroBUS™ socket labeled as AN. Selection can be performed by onboard SMD jumper labeled as A/D SEL to an appropriate position marked as AN and ADC.

The [MCP3221](#) provides one single-ended input with low power consumption, a low maximum conversion current, and a Standby current of 250µA and 1µA, respectively. Data can be transferred at rates of up to 100kbit/s in the Standard and 400kbit/s in the Fast Mode. Also, maximum sample rates of 22.3kSPS with the MCP3221 are possible in a Continuous-Conversion Mode with a clock rate of 400kHz.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to use the communication lines properly. However, the Click board™ comes equipped with a library containing easy-to-use 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	APDS-9006-020 - analog-output ambient light photosensor from Broadcom Limited
Key Features	Low power consumption, excellent responsivity which peaks in the human luminosity curve, close responsivity to the human eye, good output linearity across wide illumination range, low sensitivity variation across various light sources, stable performance over temperature and voltage, and more
Interface	Analog, I2C

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Feature	No ClickID
Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V or 5V

## Pinout diagram

This table shows how the pinout on Ambient 10 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin					Pin	Notes
Analog Signal	<b>AN</b>	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
	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	<b>5V</b>	Power Supply
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	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	AD SEL	Left	Output Voltage A/D Selection AN/ADC: Left position AN, Right position ADC

## Ambient 10 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Peak Wavelength	-	500	-	nm
Operating Temperature Range	-40	+25	+85	°C

## Software Support

We provide a library for the Ambient 10 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](#).

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## Library Description

This library contains API for Ambient 10 Click driver.

Key functions:

- `ambient10_cfg_setup` - Config Object Initialization function.
- `ambient10_init` - Initialization function.

## Examples description

This example demonstrates the use of Ambient 10 click board.

The demo application is composed of two sections :

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.Ambient10

## 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. The terminal available in all MikroElektronika [compilers](#), or any other terminal application of your choice, can be used to read the message.

## 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

[Ambient 10 click example on Libstock](#)

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[MCP3221 datasheet](#)

[APDS-9006-020 datasheet](#)

[Ambient 10 click schematic](#)

[Ambient 10 click 2D and 3D files](#)

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