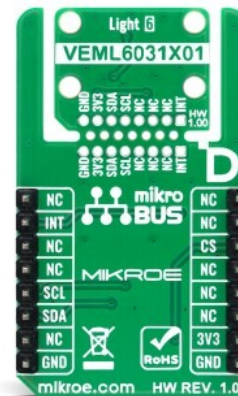
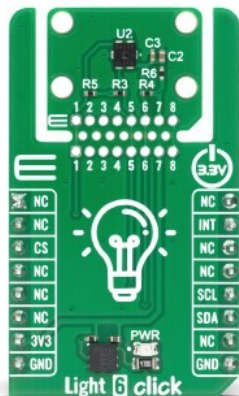


Light 6 Click



PID: MIKROE-6942

Light 6 Click is a compact add-on board designed for real-time light level detection, brightness adaptation, and illumination monitoring. It is based on the [VEML6031X01](#), a high-accuracy ambient light sensor from [Vishay Semiconductor](#). This sensor integrates a highly sensitive photodiode, a low-noise amplifier, and a 16-bit A/D converter, providing digital light measurements over a wide dynamic range from 0lx to approximately 172klx, with resolution down to 0.0026 lx/ct. It also features Vishay's Filtron™ technology for human-eye-like spectral response, excellent temperature compensation, interrupt functionality, I2C communication, and MIKROE's Click Snap feature for flexible implementation. This Click board is ideal for automotive and embedded applications such as display backlight control, infotainment systems, rear-view mirror dimming, interior lighting control systems, head-up displays, and other ambient light sensing solutions.

For more information about **Light 6 Click** visit the official [product page](#).

How does it work?

Light 6 Click is based on the VEML6031X01, a high-accuracy ambient light sensor from Vishay Semiconductor, which integrates a highly sensitive photodiode, a low-noise amplifier, and a 16-bit A/D converter to deliver digital light measurements. This sensor provides ambient light detection with a dynamic range from 0lx up to approximately 172klx, with a fine resolution down to 0.0026 lx/ct, making it suitable even for systems with low-transmittance or dark lens designs. Thanks to Vishay's Filtron™ technology, the VEML6031X01 achieves a spectral response close to that of the human eye, allowing more natural and realistic light sensing behavior in real-world environments. This Click board is suitable for applications such as display backlight control, infotainment systems, rear-view mirror dimming, interior lighting

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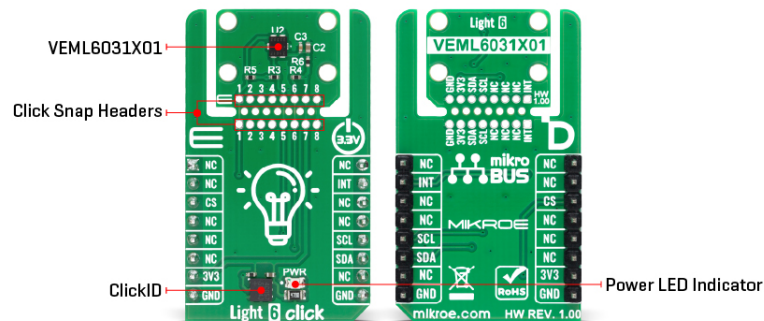


ISO 27001: 2013 certification of informational security management system.
ISO 14001: 2015 certification of environmental management system.
OHSAS 18001: 2008 certification of occupational health and safety management system.



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control systems, head-up displays, and other ambient light sensing applications.



The VEML6031X01 also maintains a typical ambient light output tolerance of $\leq 10\%$ under different light sources, ensuring stable performance across varying illumination conditions. In addition, the sensor offers excellent temperature compensation and high dynamic detection resolution, which further improves measurement consistency in demanding operating environments.

This Click board™ is designed in a unique format supporting the newly introduced MIKROE feature called "Click Snap." Unlike the standardized version of Click boards, this feature allows the main sensor/IC/module area to become movable by breaking the PCB, opening many new possibilities for implementation. Thanks to the Snap feature, the VEML6031X01 can operate autonomously by accessing its signals directly on the pins marked 1-8. Additionally, the Snap part includes a specified and fixed screw hole position, enabling users to secure the Snap board in their desired location.

Light 6 Click communicates through an I2C interface using the 0x29 slave address. Beyond communication pins, this board also uses an interrupt pin (INT) that signals the host MCU when a specific light condition is met, such as when the light levels exceeds a predefined threshold. This allows the system to respond immediately to changes in ambient light without constantly polling the sensor, thereby saving processing power and energy.

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. It also comes equipped with a library containing functions and example code that can be used as a reference for further development.

Click Snap

Click Snap is an innovative feature of our standardized Click add-on boards, designed to bring greater flexibility and optimize your prototypes. By simply snapping the PCB along predefined lines, you can easily detach the main sensor/IC/module area, reducing the overall size, weight, and power consumption - ideal for the final phase of prototyping. For more details about Click Snap, visit the [official page](#) dedicated to this feature.

Specifications

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Type	Optical
Applications	Ideal for automotive and embedded applications such as display backlight control, infotainment systems, rear-view mirror dimming, interior lighting control systems, and head-up displays
On-board modules	VEML6031X01 - ambient light sensor from Vishay Semiconductor
Key Features	High-accuracy ambient light sensing, highly sensitive photodiode, low-noise amplifier, 16-bit A/D converter, Filtron™ technology for human-eye-like response, typical ambient light output tolerance of $\leq 10\%$ under different light sources, excellent temperature compensation, high dynamic detection resolution, digital ambient light output, Click Snap, and more
Interface	I2C
Feature	Click Snap, ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Light 6 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	NC	
	NC	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 6 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Ambient Light Range	0	-	172000	lx
Ambient Light Resolution	-	0.0026	-	lx

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ADC Resolution	-	16	-	bit
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Software Support

[Light 6 Click](#) demo application is developed using the [NECTO Studio](#), ensuring compatibility with [mikroSDK](#)'s open-source libraries and tools. Designed for plug-and-play implementation and testing, the demo is fully compatible with all development, starter, and mikromedia boards featuring a [mikroBUS™](#) socket.

Example Description

This example demonstrates the use of the Light 6 Click board, which measures ambient light and infrared (IR) intensity. The application initializes the device and continuously reads ALS and IR data, displaying the results via UART logging.

Key Functions

- `light6_cfg_setup` This function initializes Click configuration structure to initial values.
- `light6_init` This function initializes all necessary pins and peripherals used for this Click board.
- `light6_default_cfg` This function executes a default configuration of Light 6 Click board.
- `light6_get_data` This function reads the raw IR data and ambient light intensity in lux based on raw ALS data.

Application Init

Initializes the logger and configures the Light 6 Click board. It establishes I2C communication and applies the default configuration settings.

Application Task

Continuously reads ambient light and infrared sensor data and logs the results in lux and raw IR values, respectively. The readings are updated every 200ms.

Application Output

This Click board can be interfaced and monitored in two ways:

- Application Output - Use the "Application Output" window in Debug mode for real-time data monitoring. Set it up properly by following [this tutorial](#).
- UART Terminal - Monitor data via the UART Terminal using a [USB to UART converter](#). For detailed instructions, check out [this tutorial](#).

Additional Notes and Information

The complete application code and a ready-to-use project are available through the NECTO Studio Package Manager for direct installation in the [NECTO Studio](#). The application code can also be found on the MIKROE [GitHub](#) account.

Resources

[mikroBUS™](#)

[mikroSDK](#)

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[Click board™ Catalog](#)

[Click boards™](#)

[ClickID](#)

Downloads

[Light 6 click example package](#)

[Light 6 click 2D and 3D files v100](#)

[Light 6 click schematic v100](#)

[VEML6031X01 datasheet](#)

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