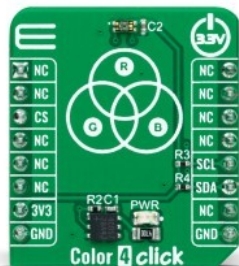


## Color 4 Click



PID: MIKROE-2220

**Color 4 Click** is a compact add-on board providing an accurate color-sensing solution. This board features the [VEML6040](#), a 16-bit RGBW color sensor offering spectral response through a compatible I2C interface from [Vishay Semiconductors](#). The VEML6040 is based on the Filtron™ technology achieving the closest ambient light spectral sensitivity to real-human eye responses. Alongside the color sensor, this IC also incorporates a signal conditioning circuit consisting of photodiodes, amplifiers, and A/D circuits placed into a single chip using the CMOS process. It provides a selectable measurement range up to 16.496lx with the highest sensitivity of 0.007865lx/step. This Click board™ is suitable for color sensing with maximum flexibility in industrial, mechanical, and consumer applications.

### How does it work?

Color 4 Click is based on the VEML6040, an advanced RGB/ambient light sensor from Vishay Semiconductors, that provides fast and accurate spectral measurements. It is based on the Filtron™ technology achieving the closest ambient light spectral sensitivity to real-human eye responses. The VEML6040 senses red, green, blue, and white light and processes those signals using a CMOS signal conditioning circuit. This digital RGBW information can be used in feedback control systems, among other things, to monitor and actively control a light source.

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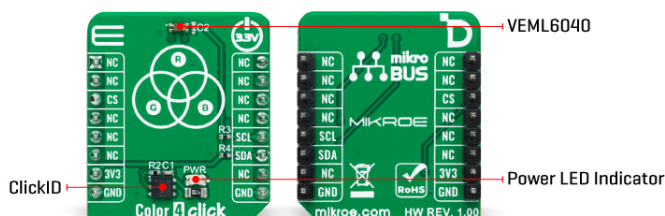
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ISO 14001: 2015 certification of environmental management system.  
OHSAS 18001: 2008 certification of occupational health and safety management system.



ISO 9001: 2015 certification of quality management system (QMS).



This Click board™ detects light intensity under multiple lighting conditions and through different attenuation materials, including dark glass. The VEML6040 provides a selectable measurement range from 515.4lx up to 16.496lx with the highest sensitivity of 0.007865lx/step. Its peak sensitivities for red, green, and blue are 645nm, 575nm, and 460nm, respectively. Moreover, it provides excellent temperature compensation, keeping the output stable under changing temperatures.

Color 4 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. The VEML6040 contains one configuration register (00h) used for operation control and parameter setup. Its measurement results are stored in four separate registers, each for red, green, blue, and white, with addresses from 08h to 0Bh, respectively. All registers are 16-bit wide.

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	Color Sensing
Applications	Can be used for industrial, mechanical, and consumer applications
On-board modules	VEML6040 - advanced RGB/ambient light sensor from Vishay Semiconductors
Key Features	Integrated RGBW and signal conditioning, Filtron™ technology provides real-human eye responses, supports low transmittance (dark) lens, high resolution, selectable detection range, high sensitivity, 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
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## Pinout diagram

This table shows how the pinout on Color 4 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	NC	
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

## Color 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Spectral Response	515.4	-	16.496	lx
Sensitivity	-	0.00786 5	-	lx/step
Peak Wavelength (R/G/B)	-	645/575 /460	-	nm
Resolution	-	16	-	bit

## Software Support

We provide a library for the Color 4 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 Color 4 Click driver.

### Key functions

- `color4_set_config` Color 4 set configuration function.
- `color4_get_color_data` Color 4 get color data function.

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- `color4_get_ambient_light` Color 4 get ambient light level function.

## Example Description

This library contains API for the Color 4 Click driver. This driver provides the functions for the sensor configuration and for reading RGBW and ambient light data from device. This example displays RGBW data, Ambient light level, CCT data and the light color names.

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.Color4

## 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 by a [mikroSDK](#) - Mikroe Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from [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

[Color 4 click example on Libstock](#)

[VEML6040 datasheet](#)

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

[Color 4 click schematic v100](#)

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