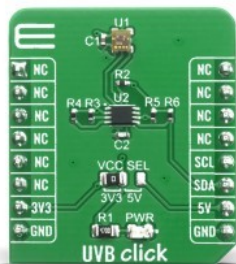


## UVB Click



PID: MIKROE-4145

**UVB Click** is ultraviolet sensing board based on [GUVB-C31SM](#) sensor from [GenUV](#), capable of measuring UV index between 0 to 16. UVB Click supports integrated functions of ultraviolet light sensors such that can be easily configured and used in user applications. Overexposure to UVB radiation not only can cause sunburn but also some forms of skin cancer, so knowing amount of UVB light can be quite important and this Click board™ is perfect solution for that task. This board can be used for various application where measuring UV light is needed such as wearable devices, weather stations, bicycle navigation and many more.

UVB Click board™ 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?

UVB Click based on GUVB-C31SM, a Digital UV Sensor from GENUV Technology. The sensor detects UVB light, as it includes on-chip GaN Sensors for UVB. The current generated by photo detectors is converted and measured by ADC and changed to 16-bit resolution digital data. The measured data can be delivered to host via I2C serial interface. Spectral responsivity of sensor is from 240nm up to 320nm which covers full range of UVB spectrum that's defined as light with wavelength from 280nm up to 315nm.

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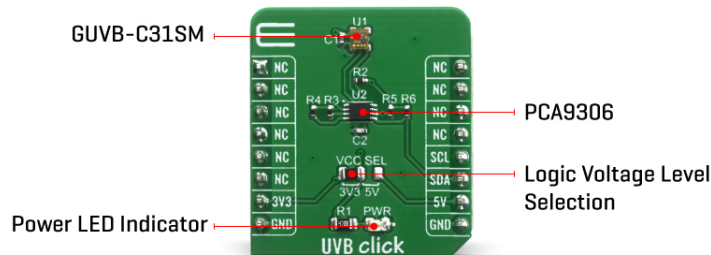
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The atmosphere blocks about 77% of the Sun's UV, of the ultraviolet radiation that reaches the Earth's surface, more than 95% is the longer wavelengths of UVA, with the small remainder UVB. Overexposure to UVB radiation not only can cause sunburn but also some forms of skin cancer. UVB radiation can cause direct DNA damage. This cancer connection is one reason for concern about ozone depletion and the ozone hole.

One of the benefits of UV light is that it causes the body to produce vitamin D (specifically, UVB), which is essential for life. The human body needs some UV radiation to maintain adequate vitamin D levels; however, excess exposure produces harmful effects that typically outweigh the benefits. With all of this in mind it's very useful to know the amount of UVB radiation that you are exposed to, and UVB Click board™ is perfect solution for such purpose, and perfect tool for developing wearable devices or weather stations that can report amount of UVB light intensity.

Since sensor is supplied with 3.3V only, also featured on this Click board™ is voltage level shifter. For the level shifting, the PCA9306 dual bidirectional I2C bus and SMBus voltage level shifter is used. This level shifter IC allows shifting (converting) the I2C signal levels to the voltage level selected by the VCC SEL onboard SMD jumper. This allows both 3.3V and 5V capable MCUs to be interfaced with the UVB Click board™.

## Specifications

|                  |                                                                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type             | Optical                                                                                                                                                                          |
| Applications     | It can be used for UV measurement applications, sun exposure protection devices, prototyping of wearables, handsets, and various consumer electronics based on received UV light |
| On-board modules | GUVB-C31SM                                                                                                                                                                       |
| Key Features     | UVB sensing with 16-bit resolution, Support UV index measurement (0~16), Response at only UV range                                                                               |
| Interface        | I2C                                                                                                                                                                              |
| Feature          | No ClickID                                                                                                                                                                       |
| Compatibility    | mikroBUS™                                                                                                                                                                        |

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|                  |                    |
|------------------|--------------------|
| 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 UVB 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         |              |
|              | 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                                                         |
|---------|------|---------|---------------------------------------------------------------------|
| PWR     | LD1  | -       | Power LED Indicator                                                 |
| VCC SEL | JP1  | Left    | Logic level voltage selection: left position 3V3, right position 5V |

## Technical specification

| Characteristic         | Value         |
|------------------------|---------------|
| UVB sensing resolution | 16-bit        |
| UV index measurement   | 0~16          |
| Spectral responsivity  | 240nm - 320nm |

## Software Support

We provide a library for the UVB Click on our [LibStock](#) page, as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

## Library Description

The library contains basic functions for working with the UVB click.

Key functions:

- void uvb\_configuration ( uint8\_t reg, uint8\_t cfg ) - Configuration register
- uint8\_t uvb\_check\_communication ( void ) - Check communication
- uint16\_t uvb\_get\_uv\_data ( void ) - Get UVB data

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## Examples description

The application is composed of three sections :

- System Initialization - Initializes I2C module
- Application Initialization - Initialization driver init, check communication and configuration module for measurement.
- Application Task - Reads UVB data and logs to the USBUART every 1500ms.

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- I2C
- UART
- Conversions

## 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

[UVB click 2D and 3D files](#)

[GUVB-C31SM datasheet](#)

[UVB click schematic](#)

[UVB click example on Libstock](#)

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