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UVC Click

PID: MIKROE-4144

UVC Click is an ultraviolet sensing board which complements UVC Light Click for a ultimate ultraviolet solution. The board is based on GUVC-T21GH ultraviolet sensor from GenUV, capable of measuring UVC spectrum in the range of 220nm up to 280nm and light intensity from 0mW/cm² up to 9.3mW/cm². With high sensitivity and good solar blindness, it can be a perfect solution for monitoring sterilization lamps used in ultraviolet germicidal irradiation (UVGI), a disinfection method that is becoming an essential tool in the battle against viruses and bacteria. UVC Click has two ways of reading UV sensor output, direct analog output value and digital output thanks to MCP3221 ADC converter.

UVC 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?

UVC Click can provide reliable and stable UVC light intensity value by using GUVC-T21GH sensor which have spectral detection range of 220nm - 280nm with output responsivity of 0.6mV/nW (at 254nm). Light intensity is converted in digital value by using MCP3221 a successive approximation A/D converter (ADC) with a 12-bit resolution.

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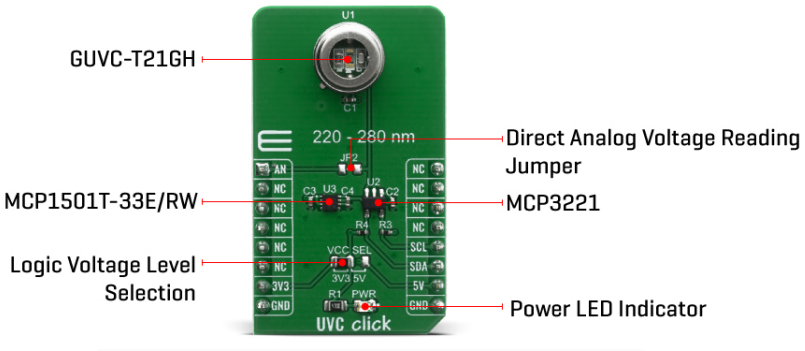

Communication to the MCP3221 is performed using a 2-wire, I2C compatible interface. Standard (100 kHz) and Fast (400 kHz) I2C modes are available with the device. An on-chip conversion clock enables independent timing for the I2C and conversion clocks.

To get reliable readings from sensor, ADC power and voltage reference is supplied from MCP1501T-33E/RW a buffered voltage reference with 3.3V output capable of sourcing up to 20mA of current as a low-drift bandgap-based reference. The bandgap uses chopper-based amplifiers, effectively reducing the drift to zero.

Second way of reading output voltage from sensor is by placing 0 ohm resistor on JP2 position labeled on PCB and reading analog value from AN pin on mikroBUS™. This way you can relay on external voltage reference and ADC with some other desired specifications for your application and you can measure light power intensity up to 14.1 mW/cm².

An SMD jumper labeled as VCC SEL can be moved to the desired position, allowing both 3.3V and 5V MCUs to be used with this Click board™.

Specifications

Type	Optical,UVC Light
Applications	It can be used for UV measurement applications, sterilization lamp monitoring, prototyping of wearables, handsets, and various consumer electronics based on received UV light
On-board modules	GUVC-T21GH
Key Features	UVC sensing with 12-bit resolution, High Sensitivity, Good Solar Blindness
Interface	Analog,I2C
Feature	No ClickID
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

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Pinout diagram

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

Notes	Pin	mikroBUS				Pin	Notes
Analog Voltage Output	**AN**	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	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	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
JP2	Jumper	NP	Jumper for direct analog voltage reading from sensor

Technical specification

Characteristic	Value
UVC sensing resolution	12-bit
Responsivity	0.6mV/nW
Spectral Detection Range	220nm - 280nm

Software Support

We provide a library for the UVC 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 UVC click.

Key functions:

- uint16_t uvc_read_raw_data( ) - Read 12bit raw data
- float uvc_get_voltage( ) - Calculate voltage
- float uvc_calculate_power(float voltage) - Calculate power

Examples description

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The application is composed of three sections :

- System Initialization - Initializes I2C module
- Application Initialization - Initializes driver init
- Application Task - Reads sensor raw data and calculating voltage and power data.

The full application code, and ready to use projects can be found on our LibStock page.

Other mikroE Libraries used in the example:

- I2C library
- 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

UVC click schematic

UVC click example on Libstock

GUVC-T21GH datasheet

UVC click 2D and 3D files