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Environment 2 Click

PID: MIKROE-4558

Environment 2 Click is a compact add-on board containing best-in-class SHT humidity and SGP air-quality sensing solutions from Sensirion. This board features SHT40 and SGP40, a high-accuracy ultra-low-power relative humidity, and a temperature sensor combined with MOx based gas sensor. The SHT40 sensor offers linearized digital output, provides constant temperature accuracy, up to 0.1°C, and shows the best performance when operated within the temperature and humidity range of 5-60°C and 20-80%RH, while the SGP40, a digital gas sensor, features a temperature-controlled micro hot-plate providing a humidity-compensated VOC-based indoor air quality signal. This Click board™ is suitable for indoor air quality and various temperature and humidity-related applications.

Environment 2 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?

Environment 2 Click as its foundation uses the SHT40 and SGP40, a high-accuracy best-in-class SHT relative humidity, and a temperature sensor combined with MOx based gas sensor from Sensirion. The SHT40 offers reduced power consumption, improved accuracy specifications, and a fully calibrated digital I2C Fast Mode Plus interface for the fastest data transfer. It covers extended operating humidity and temperature ranges from 0 to 100%RH and from -40°C to 125°C with accuracies of ±1.8%RH and ±0.2°C. On the other side, an additional gas sensor of this combo solution, the SGP40, provides a humidity-compensated VOC-based indoor air quality signal in addition to a temperature-controlled micro hot-plate.

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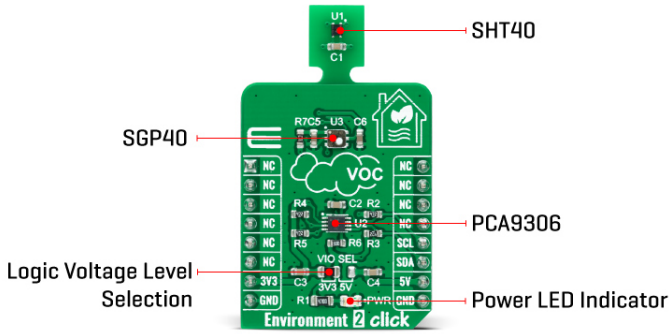

The SHT40 shows the best performance when operated within the recommended average temperature and humidity range of 5-60°C and 20-80%RH. Long-term exposure to conditions outside recommended normal range, especially at high relative humidity, may temporarily offset the RH signal. After returning to the recommended average temperature and humidity range, the sensor will recover to within specifications by itself.

The output signal of the SGP40 is processed by Sensirion's VOC Algorithm, which automatically adapts to the environment the sensor is exposed to translate the raw signal into a VOC Index. Sensing element and VOC Algorithm feature unmatched robustness against contaminating gases present in real-world applications enabling exceptional long-term stability and low drift, high reproducibility, and reliability.

Environment 2 Click communicates with MCU using the standard I2C 2-Wire interface. Since both sensors for operation requires a 3.3V logic voltage level only, this Click board™ also features the PCA9306 voltage-level translator from Texas Instruments. The I2C interface bus lines are routed to the dual bidirectional voltage-level translator, allowing this Click board™ to work with both 3.3V and 5V MCUs properly.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VIO SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to properly use the I2C communication lines. 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	Environmental
Applications	Can be used for indoor air quality and various temperature and humidity-related applications.
On-board modules	SHT40 and SGP40 - high-accuracy best-in-class SHT relative humidity, and a temperature sensor combined with MOx based gas sensor from Sensirion
Key Features	Low power consumption, high accuracy, covers extended operating humidity and

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	temperature ranges, long-term stability and lifetime, and more.
Interface	I2C
ClickID	No
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Environment 2 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	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
LD1	PWR	-	Power LED Indicator
JP1	VIO SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

Environment 2 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
SHT40 Temperature Accuracy	-	±0.2	-	°C
SHT40 Relative Humidity Accuracy	-	±1.8	-	%RH
SHT40 Operating Humidity Range	0	-	100	%RH
SGP40 Measurement Range	0	-	1000	ppm
SGP40 Operating Humidity Range	0	-	90	%RH
Operating Temperature Range	-10	+25	+50	°C

Software Support

We provide a library for the Environment 2 Click as well as a demo application (example), developed using MikroElektronika compilers. The demo can run on all the main MikroElektronika development boards.

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Package can be downloaded/installed directly from NECTO Studio Package Manager(recommended way), downloaded from our LibStock™ or found on mikroE github account.

Library Description

This library contains API for Environment 2 Click driver.

Key functions:

- environment2_cfg_setup - Config Object Initialization function.
- environment2_init - Initialization function.
- environment2_default_cfg - Click Default Configuration function.

Examples description

This library contains API for Environment 2 Click driver. The library contains drivers for measuring air quality, temperature and relative humidity.

The application is composed of three 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.Environment2

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

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Click boards™

Downloads

SHT40 datasheet

SGP40 Datasheet

Environment 2 click 2D and 3D files

Environment 2 click schematic

PCA9306 datasheet

Environment 2 click example on Libstock