

Environment 4 Click



PID: MIKROE-5526

Environment 4 Click is a compact add-on board combining 4th-generation SHT humidity and SGP air-quality sensing solutions from [Sensirion](#). This board features the [SHT41A-AD1B](#) I2C-configurable high-accuracy relative humidity/temperature and the [SGP41](#), an MOx-based gas sensor. The SHT41A-AD1B offers a linear digital output alongside temperature/humidity accuracy up to $\pm 0.3^\circ\text{C}/\pm 2\% \text{RH}$. It performs best within the operating range of $5\text{-}60^\circ\text{C}$ and $20\text{-}80\% \text{RH}$. With the help of the SGP41 which features a temperature-controlled micro hotplate, it also provides a humidity-compensated VOC and NOx-based indoor air quality signal. This Click board™ is suitable for measuring relative humidity and temperature in air purifiers or demand-controlled ventilation systems.

How does it work?

Environment 4 Click is based on the SHT41A-AD1B, a 4th-generation high-accuracy SHT relative humidity and temperature sensor, combined with the SGP41 MOx-based gas sensor from Sensirion. Based on Sensirion's proven CMOSens® Technology and long-standing experience in humidity sensing, the SHT41A-AD1B ensures the highest precision. It covers extended operating humidity and temperature ranges from 0 to 100%RH and from -40°C to 125°C with accuracies of $\pm 2\% \text{RH}$ and $\pm 0.3^\circ\text{C}$. The SHT41A-AD1B also specializes in automotive applications, fulfilling reliability requirements such as $85^\circ\text{C}/85\% \text{RH}$ accelerated life tests and AEC Q100 qualification.

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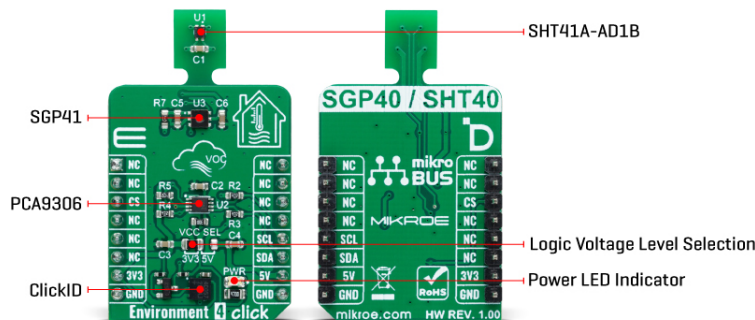
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The SHT41A-AD1B shows the best performance when operated within the recommended average temperature and humidity range of 5-60°C and 20-80%RH. Long-term exposure to conditions outside recommended normal range, especially at high relative humidity, may temporarily offset the RH signal. After returning to the recommended average temperature and humidity range, the sensor will recover to within specifications. The complementary part of this combo solution is the SGP41, Sensirion’s new MOx-based gas sensor, that provides one VOC and one NOx-based indoor air quality signal.

As mentioned, the SGP41 provides two raw digital signals that are sensitive to most VOCs typically found in indoor environments, plus oxidizing gases such as NOx or O3. This feature means that this board can be used to constantly monitor the VOC and NOx situation, including potentially harmful events which humans cannot perceive. The raw signals are proportional to the logarithm of the resistance of the sensing material and are processed by Sensirion’s mighty Gas Index Algorithm. This can be used to automatically trigger the removal of indoor air gas pollutants by air treatment devices without requiring a manual user intervention.

Environment 4 Click communicates with MCU using the standard I2C 2-Wire interface. Since both sensors require only a 3.3V logic voltage level for operation, 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 appropriately with both 3.3V and 5V MCUs.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, for both 3.3V and 5V capable MCUs can use the communication lines correctly. 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 measuring relative humidity and temperature in air purifiers or demand-controlled ventilation systems
On-board modules	SHT41A-AD1B - 4th-generation high-accuracy SHT relative humidity, and a temperature

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	sensor from Sensirion SGP41 - MOx based gas sensor from Sensirion
Key Features	Low power consumption, high accuracy, covers extended operating humidity and temperature ranges, long-term stability and lifetime, I2C interface, and more
Interface	I2C
Feature	ClickID
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 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	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	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	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

Environment 4 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
SHT41A Temperature Accuracy	-	±0.3	-	°C
SHT41A Relative Humidity Accuracy	-	±2	-	%RH
SGP41 Measurement Range (TVOC)	0	-	1000	ppm

Software Support

We provide a library for the Environment 4 Click as well as a demo application (example), developed using Mikroe [compilers](#). The demo can run on all the main Mikroe [development](#)

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[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 Environment 4 Click driver.

Key functions

- `environment4_sht_read_meas_hp` This function reads the temperature and humidity measurements with high precision from SHT41A device.
- `environment4_sgp_exe_conditioning` This function executes conditioning command for SGP41 device by using I2C serial interface.
- `environment4_sgp_meas_raw_signals` This function measures raw signals for SGP41 device by using I2C serial interface.

Example Description

This example demonstrates the use of Environment 4 Click board™ by reading the temperature and humidity data and calculating VOC and NOx indexes.

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.Environment4

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. A UART terminal is available in all Mikroe [compilers](#).

mikroSDK

This Click board™ is supported with [mikroSDK](#) - Mikroe 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™](#)

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[mikroSDK](#)

[Click board™ Catalog](#)

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[ClickID](#)

Downloads

[Environment 4 click example on Libstock](#)

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

[SHT41A-AD1B datasheet](#)

[SGP41 datasheet](#)

[PCA9306 datasheet](#)

[Environment 4 click schematic v100](#)

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