

Temp&Hum 14 Click



PID: MIKROE-4306

Temp & Hum 14 Click is a compact add-on board that contains one of the smallest and most accurate humidity and temperature sensors on the market. This board features the [HTU31D](#), a highly accurate digital relative humidity sensor with temperature output from [TE Connectivity](#). With power consumption down to $3.78\mu\text{W}$ and accuracy of $\pm 2\%\text{RH}$ and $\pm 0.2^\circ\text{C}$, this Click board™ provides fast response time, precision measurement, low hysteresis, and sustained performance even when exposed to extreme temperature up to 125°C and humidity environments. This Click board™ is suitable for relative humidity and temperature measuring applications, including weather stations, reliable monitoring systems, and more.

Temp & Hum 14 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?

Temp & Hum 14 Click is based on the HTU31D, a digital relative humidity sensor with temperature output from TE Connectivity. Both sensors inside of the HTU31D are individually calibrated, compensated, and tested. The humidity can be measured within a range of 0 to 100 %RH, while the temperature sensor is designed for a range of -40 to 125°C . The typical accuracy for humidity is $\pm 2\%\text{RH}$ in the measuring range of 20 up to 100 %RH at ambient temperature and $\pm 0.2^\circ\text{C}$ for temperature between 0 - 100°C with power consumption down to $3.78\mu\text{W}$.

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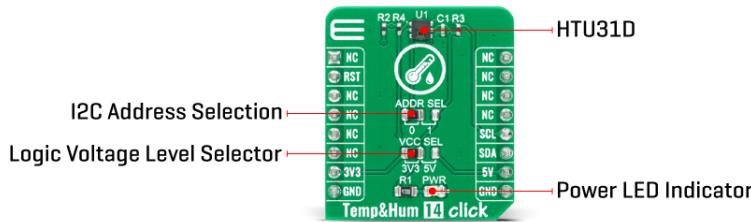
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This Click board™, an I2C configurable environmental sensor, is characterized by high reliability and full interchangeability with no calibration required in standard conditions. It has a quick recovery time after long periods in the saturation phase, low power consumption, and fast response time. Also, this sensor provides sustained performance even when exposed to extreme temperatures up to 125°C and humidity environments.

Temp & Hum 14 Click communicates with MCU using the standard I2C 2-Wire interface with a maximum frequency of 10MHz. The HTU31D can answer 2 I2C addresses and allows the choice of the least significant bit (LSB) by positioning SMD jumpers labeled as ADDR SEL to an appropriate position marked as 0 and 1. In addition to this feature, this Click board™ also contains additional functionality routed to the RST pin on the mikroBUS™ socket. The RST pin can be used to generate a reset of the sensor with a minimum pulse duration of 1 μ s required to trigger this function.

The HTU31D also offers a diagnostic register that can be used to check whether the values for humidity and temperature are outside the specified range. The CRC check (Cyclic Redundancy Check) ensures secure data transmission. The humidity and temperature signal response time, as well as the recovery time (after complete condensation), are within a range of a few seconds.

This Click board™ is designed to be operated with both 3.3V and 5V logic voltage levels that can be selected via VCC SEL jumper. This allows for both 3.3V and 5V capable MCUs to use the I2C communication lines properly. However, the Click board™ comes equipped with a library that contains easy to use functions and an example code that can be used as a reference for further development.

Specifications

Type	Temperature & humidity
Applications	Can be used for relative humidity and temperature measuring applications, including weather stations, reliable monitoring systems, and more.
On-board modules	Temp & Hum 14 Click is based on the HTU31D, a digital relative humidity sensor with temperature output from TE Connectivity.

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Key Features	High reliability and environmental robustness, full interchangeability with no calibration required in standard conditions, quick recovery after long periods in saturation phase, low power consumption, fast response, and more.
Interface	I2C
ClickID	No
Compatibility	mikroBUS™
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 Temp&Hum 14 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	
Reset	RST	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	VCC SEL	Left	Power Supply Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	ADDR SEL	Left	Communication interface selection: Left position 0, Right position 1

Temp&Hum 14 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-0.3	-	6	V
Current consumption	-	-	0.45	mA
Humidity Operating Range	0	-	100	%RH
Relative Humidity Accuracy	-	±2	-	%RH
Temperature Accuracy	-	±0.2	-	°C
Operating Temperature Range	-40	-	+125	°C

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Software Support

We provide a library for the Temp&Hum 14 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 covers all the necessary functions to control Temp&Hum 14 Click board™. Library performs a standard I2C interface communication.

Key functions:

- void temphum14_set_conversion (uint8_t hum_osr, uint8_t temp_osr) - Set conversion function.
- void temphum14_get_diagnostic (temphum14_diagn_t *diag_data) - Get diagnostic status function.
- void temphum14_get_temp_and_hum (float *temp, float *hum) - Get temperature and humidity data function.

Examples description

The application is composed of three sections :

- System Initialization - Initializes I2C, set RST as output and start to write log.
- Application Initialization - Initialization driver enables - I2C, hardware reset the device and read the serial number, also write log.
- Application Task - (code snippet) This is an example that demonstrates the use of the Temp & Hum 14 Click board™. Temp & Hum 14 Click board™ can be used to measure temperature and relative humidity. All data logs write on USB uart changes every 3 sec.

Additional Functions :

- void display_diagnostic (void) - Display diagnostic.

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

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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

[Temp&Hum 14 click 2D and 3D files](#)

[Temp&Hum 14 click schematic](#)

[Temp&Hum 14 click example on Libstock](#)

[HTU31D datasheet](#)

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