

Temp&Hum 16 Click



PID: MIKROE-4733

Temp&Hum 16 Click is a compact add-on board that represents temperature and humidity sensing solutions. This board features the [WSEN-HIDS \(2525020210001\)](#), a MEMS-based capacitive humidity sensor with an integrated ASIC and I2C and SPI serial communication from [Würth Elektronik](#). A silicon-based temperature sensor is also integrated within the same package. ASIC contains the multiplier, operational amplifier, analog-to-digital converter, and other signal conditioning blocks like controller logics and interrupts. It converts the analog signal from humidity and temperature sensing elements into 16-bit digital humidity and temperature values. The WSEN-HIDS is factory calibrated for both humidity and temperature measurements with no further calibration required. This Click board™ is an ideal solution to be used in various temperature and humidity-related applications.

Temp&Hum 16 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 16 Click as its foundation uses the WSEN-HIDS, a 16-bit digital ultra-low-power and high-performance humidity sensor with digital output interface and embedded temperature sensor for ambient temperature measurement from Würth Elektronik. It measures relative humidity from 0 to 100% RH with an output data rate of up to 12.5Hz. The sensor is fully calibrated with no further calibration required. The initialization of the sensor can be performed by selecting the operation mode (Continuous or One-shot) and output data rate.

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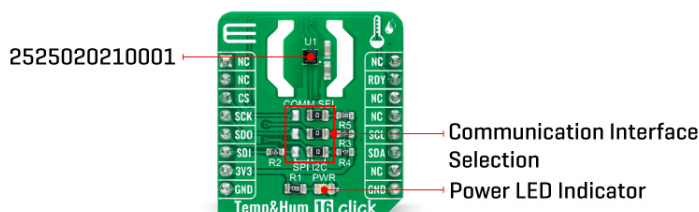
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After initializing the sensor, it is recommended to check the availability of data samples using an interrupt signal labeled RDY and routed to the INT pin on the mikroBUS™ socket. By default, after powering up, the sensor goes to power-down mode. In power-down mode, all internal blocks are turned off to minimize power consumption. After selecting one of the two operating modes, the sensor is in an active measurement state depending on the output data rate.

Temp&Hum 16 Click provides the possibility of using both I2C and SPI interfaces with a maximum frequency of 100kHz in Standard and 400kHz in Fast mode for I2C and 8MHz for 3-wire SPI communication. 3-wire SPI shares a single data line for the data transfer, where the Master and Slave alternate their transmitter and receiver roles synchronously. The communication interface selection can be made by positioning SMD jumpers labeled COMM SEL to an appropriate position. Note that all the jumpers' positions must be on the same side, or else the Click board™ may become unresponsive.

This Click board™ can be operated only with a 3.3V logic voltage level. The board must perform appropriate logic voltage level conversion before use with MCUs with different logic levels. However, the Click board™ comes equipped with a library containing functions and an example code that can be used, as a reference, for further development.

Specifications

Type	Temperature & humidity
Applications	This Click board™ is an ideal solution to be used in various temperature and humidity-related applications
On-board modules	WSEN-HIDS (2525020210001) - MEMS-based capacitive humidity sensor with an integrated ASIC and I2C and SPI serial communication from Würth Elektronik
Key Features	Low power consumption, high performance, digital output interface, embedded temperature sensor for ambient temperature measurement, fully calibrated, and more.
Interface	I2C,SPI
Feature	No ClickID

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Compatibility	mikroBUS™
Click board size	S (28.6 x 25.4 mm)
Input Voltage	3.3V

Pinout diagram

This table shows how the pinout on Temp&Hum 16 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	RDY	Data-Ready Signal
SPI Chip Select	CS	3	CS	RX	14	NC	
SPI Clock	SCK	4	SCK	TX	13	NC	
SPI Data OUT	SDO	5	MISO	SCL	12	SCL	I2C Clock
SPI Data IN	SDI	6	MOSI	SDA	11	SDA	I2C Data
Power Supply	3.3V	7	3.3V	5V	10	NC	
Ground	GND	8	GND	GND	9	GND	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1-JP3	COMM SEL	Right	Communication Interface Selection SPI/I2C: Left position SPI, Right position I2C

Temp&Hum 16 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	-	3.3	-	V
Humidity Measurement Range	0	-	100	%RH
Resolution	-	16	-	bits
Output Data Rate	1	-	12.5	Hz
Operating Temperature Range	-40	+25	+120	°C

Software Support

We provide a library for the Temp&Hum 16 Click as well as a demo application (example), developed using MikroElektronika [compilers](#). The demo can run on all the main MikroElektronika [development boards](#).

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

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This library contains API for Temp&Hum 16 Click driver.

Key functions:

- temphum16_cfg_setup - Config Object Initialization function.
- temphum16_init - Initialization function.
- temphum16_default_cfg - Click Default Configuration function.

Examples description

This library contains API for the Temp&Hum 16 Click driver. This demo application shows an example of humidity and temperature measurement.

The demo application is composed of two 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.TempHum16

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

[Temp&Hum 16 click 2D and 3D files](#)

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[Temp&Hum 16 click schematic](#)

[WSEN-HIDS\(282525020210001\) datasheet](#)

[Temp&Hum 16 click example on Libstock](#)

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