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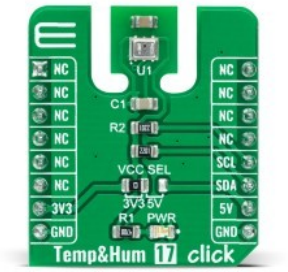
Temp&Hum 17 Click



PID: MIKROE-4702

Temp&Hum 17 Click is a compact add-on board that represents temperature and humidity sensing solutions. This board features the HS3001, a highly accurate, fully calibrated relative humidity and temperature sensor from Renesas. It features proprietary sensor-level protection, ensuring high reliability and long-term stability. Integrated calibration and temperature-compensation logic provides fully corrected RH and temperature values via standard I2C output. No user calibration of the output data is required. The high accuracy, fast measurement response time, and long-term stability make this Click board™ ideal for various temperature and humidity-related applications and a vast number of applications ranging from portable devices to products designed for harsh environments.

Temp&Hum 17 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 17 Click as its foundation uses the HS3001, a highly accurate, fully calibrated relative humidity and temperature sensor from Renesas. The humidity can be measured within a range of 0 to 100 %RH, while the temperature sensor is designed for a range of -10 to 80 °C. The typical accuracy for humidity is ±1.5 %RH in the measuring range of 10 up to 90 %RH at ambient temperature, and ±0.2 °C for temperature between -10 - +80 °C with very low power consumption.

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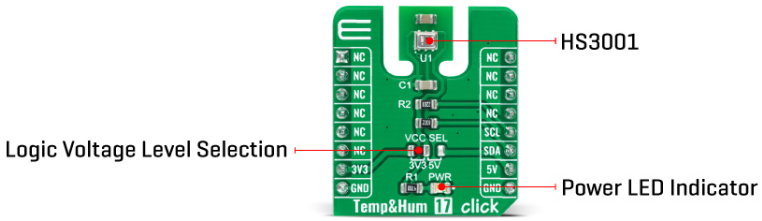

The HS3001 digital sensor accurately measures relative humidity and temperature levels. The measured data is internally corrected and compensated for accurate operation over a wide range of temperature and humidity levels, which brings us to its highlighted feature - user calibration is not required. The entire output consists of only four bytes of data; that's why calculating the corresponding relative humidity in percent and temperature in degrees Celsius is very easy.

Temp&Hum 17 Click communicates with MCU using the standard I2C 2-Wire interface to read data and configure settings, supporting Standard Mode operation with a clock frequency up to 100kHz and Fast Mode up to 400kHz. The HS3001 is also factory-programmed to operate even in Sleep Mode. In Sleep Mode, the sensor waits for commands from the MCU before taking measurements and only performs conversions when it receives a Measurement Request command; otherwise, it is always powered down.

This Click board™ can operate with both 3.3V and 5V logic voltage levels selected via the VCC SEL jumper. This way, it is allowed for both 3.3V and 5V capable MCUs to use the I2C communication lines properly. 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	Temperature & humidity
Applications	Can be used for various temperature and humidity-related applications and a vast number of applications ranging from portable devices to products designed for harsh environments
On-board modules	HS3001 - highly accurate, fully calibrated relative humidity and temperature sensor from Renesas
Key Features	Low power consumption, high performance RH and °C sensing, digital output interface, independent programmable resolution settings, fully calibrated, and more
Interface	I2C

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Feature	No ClickID
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 17 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	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V

Temp&Hum 17 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Humidity Measurement Range	0	-	100	%RH
Humidity Accuracy	-	±1.5	-	%RH
Resolution	8	-	14	bits
Temperature Accuracy	-	±0.2	-	°C
Operating Temperature Range	-10	+25	+85	°C

Software Support

We provide a library for the Temp&Hum 17 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.

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Library Description

This library contains API for Temp&Hum 17 Click driver.

Key functions:

- temphum17_cfg_setup - Config Object Initialization function.
- temphum17_init - Initialization function.
- temphum17_default_cfg - Click Default Configuration function.

Examples description

This library contains API for the Temp&Hum 17 Click driver. This demo application shows an example of relative 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.TempHum17

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

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Temp&Hum 17 click 2D and 3D files

HS3001 datasheet

Temp&Hum 17 click schematic

Temp&Hum 17 click example on Libstock

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