

SHT AN Click



PID: MIKROE-3984

SHT AN Click is a sensorics based add on board which can be used for measuring humidity and temperature. It features fully calibrated, linearized and temperature compensated [SHT31-ARP-B](#) sensor with analog output. This sensor is built on a new technology CMOSens® sensor chip from [Sensirion](#). What differentiate this Click board comparing to other is dual sensor analog output which can be used for measuring and calculation of the data over one analog output. This board is best suitable for the smart and low power applications which require temperature range of -40 to up to 90 °C. We have also in our offer SHT Click, which is a digital interface version of the same sensor.

SHT AN 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?

SHT AN Click is featuring SHT31-ARP-B that was built on a completely new and optimized CMOSens® chip, which allows for increased reliability and improved accuracy specifications. Sensor can be ordered with filter membrane which is a PTFE film that protects sensor from opening from water and dust.

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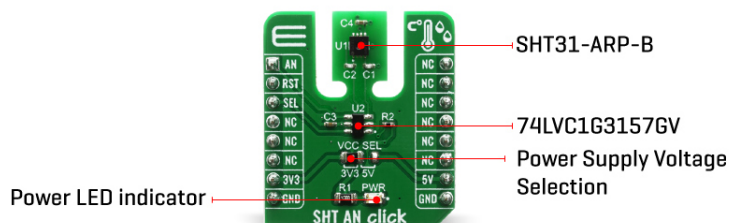
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Since the SHT31-ARP-B is a temperature and humidity (T and RH) sensor with two analog outputs for each measurement, and on the mikroBUS socket we have only one Analog output we multiplexed sensor output by using 74LVC1G3157GV, 2-channel analog multiplexer/demultiplexer. Switching between temperature and humidity measurements is performed by asserting the selection input (SEL) which is connected to the multiplexer and by that way selecting desired data output.

Measured data is supplied as radiometric voltage output, after reading the temperature or humidity analog signal user will have to do conversion to a physical value. The physical values as measured by the sensor are mapped to a radiometric voltage output (VT, VRH as 10 to 90% of VDD). Prior to conversion into a voltage signal, the physical values are linearized and compensated for temperature and supply voltage effects by the sensor. Additionally, the voltage output is calibrated for each sensor.

The nRST pin is active low and may be used to generate a reset of the sensor. A minimum pulse duration of 1 μ s is required to reliably trigger a reset. The nRST signal is routed to the mikroBUS™ RST pin.

This Click board™ can be supplied and interfaced with both 3.3V and 5V without the need for any external components. The onboard SMD jumper labeled as VCC SEL allows voltage selection for interfacing with both 3.3V and 5V microcontrollers.

Specifications

Type	Temperature & humidity
Applications	Industrial RH and temperature measuring applications, smart home, air conditioner, home and environmental monitoring, etc...
On-board modules	SHT AN Click uses the SHT31-ARP, a high accuracy temperature and humidity sensor from Sensirion.
Key Features	Key Features Low energy consumption, wide temperature and humidity operating range with low RH response time, small package
Interface	Analog,GPIO

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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 SHT AN Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikro™ BUS				Pin	Notes
Analog Output	AN	1	AN	PWM	16	NC	
Sensor Reset	RST	2	RST	INT	15	NC	
Selection of measurement channel	SEL	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	NC	
	NC	6	MOSI	SDA	11	NC	
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
JP2	VCC SEL	Left	Power Supply Voltage Selection Jumper: Left position 3.3V, right position 5V

SHT AN Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	2.4	-	5.5	V
Operating Temperature Range	-40	-	125	°C
Temperature accuracy	-	+/- 0.3	-	°C
Humidity accuracy	-	+/- 2.0	-	%RH

Software Support

We provide a library for the SHT AN 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 SHT AN Click board.

Key functions :

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- void shtan_set_mode (uint8_t adc_mode) - Set ADC mode function.
- void shtan_reset (void) - Hardware reset function.

Examples description

The application is composed of three sections :

- System Initialization - Initializes GPIO and start to write log.
- Application Initialization - Initialization driver enables - GPIO, sw reset, initializes ADC, set ADC channel and sets ADC read mode.
- Application Task - (code snippet) This is a example which demonstrates the use of SHT AN Click board. Measured temperature and humidity ADC data and calculate temperature data to degrees Celsius [°C] and humidity data to percentarg [%]. Results are being sent to the Usart Terminal where you can track their changes. All data logs on usb uart for aproximetly every 3 sec.
- void shtan_calculate_temperature (void) - Calculate temperature
- void shtan_calculate_humidity (void) - Calculate humidity
- void display_log (float value) - Displays readings as floating point value with two decimal places

The full application code, and ready to use projects can be found on our [LibStock](#) page.

Other mikroE Libraries used in the example:

- ADC
- 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

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™](#)

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Downloads

[SHT AN click example on Libstock](#)

[SHT AN click 2D and 3D files](#)

[SHT31-ARP datasheet](#)

[SHT AN click schematic](#)

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