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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 <u>SHT31-ARP-B</u> sensor with analog output. This sensor is built on a new technology CMOSens® sensor chip from <u>Sensirion</u>. 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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ISO 27001: 2013 certification of informational security management system. ISO 14001: 2015 certification of environmental management system. OHSAS 18001: 2008 certification of occupational health and safety management system.





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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 suing 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 mikroBUSTM 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

| Туре | 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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| 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 SHT AN Click corresponds to the pinout on the mikroBUS^m socket (the latter shown in the two middle columns).

| Notes | Pin | ● ● mikro* ● ● ● BUS | | | TM- | Pin | Notes |
|---------------------|------|-------------------------|------|-----|-----|-----|--------------|
| Analog Output | AN | 1 | AN | PWM | 16 | NC | |
| Sensor Reset | RST | 2 | RST | INT | 15 | NC | |
| Selection of | SEL | 3 | CS | RX | 14 | NC | |
| measurement channel | | | | | | | |
| | NC | 4 | SCK | ΤX | 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 | Тур | 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 as well as a demo application (example), developed using MIKROE <u>compilers</u>. The demo can run on all the main MIKROE <u>development boards</u>.

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 SHT AN Click driver.

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Key functions

- Function sets signal output ADC mode
- of the SHT3x-ARP Humidity and Temperature Sensor IC on SHT
- ANClick.
- Function hardware reset the SHT3x-ARP Humidity and Temperature Sensor IC
- on SHT AN click by cleared to '0' state of the RST pin,
- wait the 100 ms, sets to '1' state of the RST pin.

Example Description

This example demonstrates the use of SHT AN Click to measure temperature and humidity.

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.ShtAn

Additional notes and informations

Depending on the development board you are using, you may need <u>USB UART click</u>, <u>USB UART</u> <u>2 Click</u> or <u>RS232 Click</u> to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE <u>compilers</u>.

mikroSDK

This Click board^{\mathbb{M}} is supported with <u>mikroSDK</u> - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board^{\mathbb{M}} demo applications, mikroSDK should be downloaded from the <u>LibStock</u> and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

<u>mikroBUS</u>™

<u>mikroSDK</u>

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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