Datasheet Evaluation Kit EK-H5

For Humidity and Temperature Sensors

- Simple and easy-to-use evaluation kit
- Viewer software available for download
- USB Interface

Product Summary

The evaluation kit is made for running Sensirion's humidity and temperature sensors. It is held very compact: a USB dongle with USB to I²C translator capabilities allows connecting the sensor directly to the USB port. With the accompanying viewer software it is possible to communicate with the sensors, display measured values and export data into a csv file. The evaluation kit is available in two versions. The standard version is available for sensors that can operate at 3.3 V, while the 1.8V version is for the sensors operated at 1.8 V.

The viewer software can be downloaded from the Sensirion web page and allows logging data for SHT3x, SHTW2, SHTC1, SHT7x and for STSC1, STS21. For the SHT3x sensor series it is possible to use the alert function, the internal heater as well as the ART function. The main purpose of the evaluation kit is to demonstrate the unique performance of Sensirion's humidity and temperature sensor without the requirement of any hardware or software design work.

Set-Up of EK-H5 (Order No. 1-100738-02)

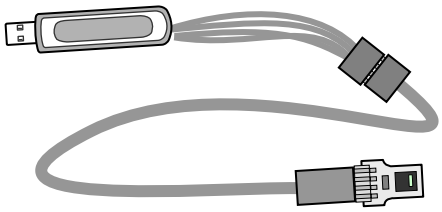


Figure 1 Schematic of Evaluation Kit EK-H5.

Material Contents

- **1 EK-H5 USB Stick:** Contains USB to I²C translator capabilities.
- **1 Sensor cable** of 1m length with a plug for connecting the USB dongle with a combo connector for connecting a sensor on PCB or FPCB.
- **1 SHT31-DIS sensor:** mounted on PCB.
- **1 SHT31-DIS sensor:** mounted on FPCB.
- **1 SHT21 sensor:** mounted on PCB.

Set-Up of EK-H5 1.8V (Order No. 1-101021-03)

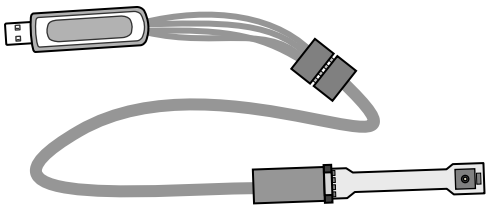


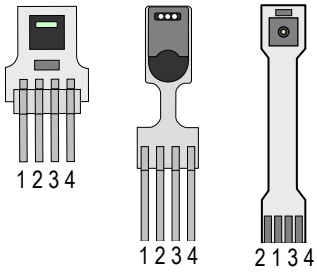
Figure 2 Schematic of Evaluation Kit EK-H5 1.8V.

Material Contents

- **1 EK-H5 USB Stick:** Contains USB to I²C translator capabilities.
- **1 Sensor cable** of 1m length with a plug for connecting with USB dongle and a ZIF connector for connecting with a sensor on FPCB. Please note that a level shifter board is integrated into the cable. This level shifter converts the 3.3V on the USB dongle side to 1.8V on the sensor side**.**
- **1 SHTC1 sensor:** mounted on FPCB.
- **1 SHTW2 sensor:** mounted on FPCB.
- **1 STSC1 sensor:** mounted on FPCB.

Please note that 1.8V sensors must be operated with the cable supplied in the EK-H5 1.8V which contains the level shifter that converts the voltage level of 3.3 V on the USB dongle side to 1.8V on the sensor side. Using the wrong supply can damage the sensor.

EK-H5 Pin Assignment



Sensor Pin	Name	Description
1	SCL	Serial clock
2	VDD	Supply voltage
3	VSS	Ground
4	SDA	Serial data

Table 1 Pin Assignments: SHTxx on PCB, SHT71 and SHTxx on FPCB sensors.

Viewer Software

The appearance of the viewer software is slightly different for the different sensor types. The main difference is that the viewer software for the SHT3x includes additional features (Alert mode, Heater and ART), which are not available in the other sensor types.

The viewer software displays relative humidity and temperature data on two different windows. It allows for setting absolute or relative timing and change the displaying between °C and °F. The data may be logged, stored and exported to a CSV file, which can be imported to Microsoft Excel.

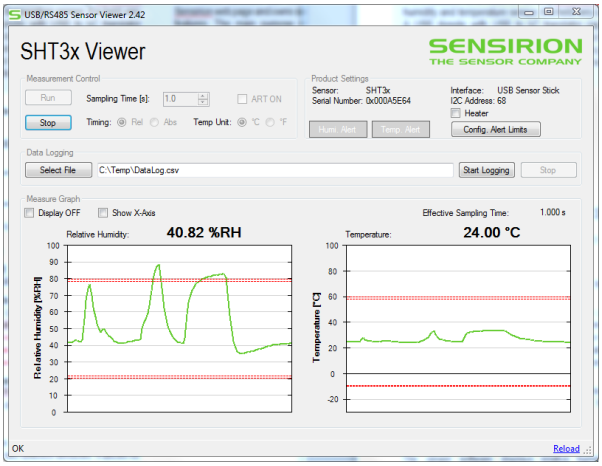


Figure 3 Viewer Software window for the SHT3x

The viewer Software must be downloaded from the Sensirion web page:

http://www.sensirion.com/usb-viewer/

Please note that the USB stick, sensor cable and sensor must be connected to the computer before starting the software. No further software driver or any other hardware is required for running EK-H5.

When starting the viewer software, the type of sensor must be selected in a first window (several sensors are given for choice). The settings (explained below) must be chosen and then the measurement may be started.

Features

Sampling Time [s]: Defines the number of measurements per second. For the SHT2x, SHT1x/SHT7x and SHTC1 sensor series the measurement intervals are free of choice in the range from 1 … 1440s.

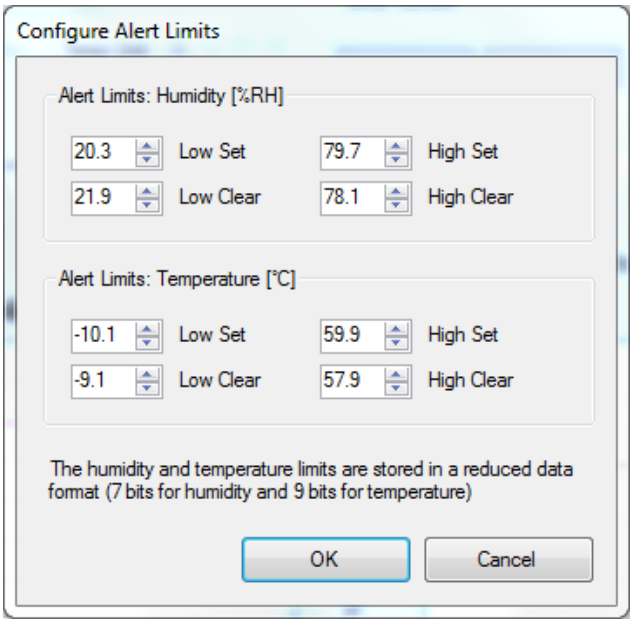
The SHT3x is operated in periodic-mode: the value in this field is rounded to the nearest periodic acquisition frequency as shown in the datasheet. After clicking the RUN button a single initial command is send to the sensor. After this the viewer software only reads out the measured values from the sensor. When the STOP button is clicked, the sensor stops to measure and is switched to idle mode.

Resolution: Allows changing the resolution for SHT2x and SHT1x/SHT7x for RH & T. The sensor SHTC1 and SHT3x always measure with the highest repeatability (longest measurement time).

Heater: This checkbox is only available for the SHT3x series and switches the built-in heater on/off (ticked/not-ticked). Since the heater power is dependent on the supply voltage, higher temperatures are achievable with larger V_{DD}, and vice versa. Please note the supply voltage of the EK-H5 cannot be changed, it is fixed to 3.3 V.

ART ON: The SHT3x's unique Accelerated Response Time (ART) functionality is controlled through this box. This feature electronically speeds up the humidity response of the sensor. This feature only works in periodic mode at 4 Hz and for high-resolution measurements. For this reason the sampling time is set to a predefined value of 0.1 s. Changing the sampling time in this mode only affects the time when the viewer reads out values from the sensor, but it does not affect the acquisition frequency of the sensor itself.

Config. Alert Limits: This button is used to set the "Alert limits", which are reference thresholds for the ALERT signal, available when the SHT3x is operated in periodic data acquisition mode. The ALERT signal allows monitoring the environmental conditions (humidity and temperature) relative to these programmable limits.



The function of the alert feature is explained in a separate App Note, which is available from Sensirion's Download Center.

Please note that the sensor handles the limit information in a reduced data format (see App Note). The standard data format of SHT3x-DIS has a width of 16 bits. For the limits only the most significant bits (MSB) are used to determine whether an alert has been met (7 bits for humidity and 9 bits for temperature). When the user inserts a limit, the EK-H5 software automatically converts the inserted value to the closest value matching this data format and displays it.

When limit values are reached, the SHT3x will change the value of the dedicated ALERT pin. Additionally, a status register bit changes value. The "Humi. Alert" and "Temp. Alert" cells on the main EK-H5 software screen indicate the value of the respective status register bit (bit 11 for RH and bit 10 for T). When the humidity and temperature values are within the set limits (e.g. Alert OFF) the cells are greyed-out. When the defined limit values are exceeded (e.g. Alert ON) the cells turn red.

Configured limits can be changed during operation (after the run button has been clicked) and are shown as red dashed lines on the main EK-H5 software screen data plots (see for example Figure 1).

Serial Number: The SHT2x, SHTC1 and SHT3x sensor series provide a device specific serial number which can be read-out via the serial interface (I^2C). The Serial number allows an unambiguous identification of each individual device. It is automatically displayed on the main EK-H5 software screen data plots in the Product Settings section.

Revision History

Date	Version	Page(s)	Changes
January 2010	1.0	1 – 2	Initial release
August 2012	2.0	1	Changed hyperlink
February 2015	3.0	all	Modifications to include SHT3x as well the Evaluation Kit for SHTC1
21. July 2015	4	All	Combined EK-H5 and EK-H5 1.8V, added pin assignment
30. August 2016	5	1	Replaced SHTW1 with SHTW2

Important Notices

Warning, Personal Injury

Do not use this product as safety or emergency stop devices or in any other application where failure of the product could result in personal injury. Do not use this product for applications other than its intended and authorized use. Before installing, handling, using or servicing this product, please consult the data sheet and application notes. Failure to comply with these instructions could result in death or serious injury.

If the Buyer shall purchase or use SENSIRION products for any unintended or unauthorized application, Buyer shall defend, indemnify and hold harmless SENSIRION and its officers, employees, subsidiaries, affiliates and distributors against all claims, costs, damages and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if SENSIRION shall be allegedly negligent with respect to the design or the manufacture of the product.

ESD Precautions

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation, take customary and statutory ESD precautions when handling this product.
See application note “ESD, Latchup and EMC” for more information.

Warranty

SENSIRION warrants solely to the original purchaser of this product for a period of 12 months (one year) from the date of delivery that this product shall be of the quality, material and workmanship defined in SENSIRION’s published specifications of the product. Within such period, if proven to be defective, SENSIRION shall repair and/or replace this product, in SENSIRION’s discretion, free of charge to the Buyer, provided that:

- notice in writing describing the defects shall be given to SENSIRION within fourteen (14) days after their appearance;
- such defects shall be found, to SENSIRION’s reasonable satisfaction, to have arisen from SENSIRION’s faulty design, material, or workmanship;
- the defective product shall be returned to SENSIRION’s factory at the Buyer’s expense; and
- the warranty period for any repaired or replaced product shall be limited to the unexpired portion of the original period.

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