

Evaluation Kit EK-H2 Version 4.0

For Humidity & Temperature Sensors

Introduction

The evaluation kit EK-H2 provides an easy-to-use, plug-and-play system – including hard and software – for evaluating and demonstrating SHTxx humidity and temperature sensors. All types of SHTxx sensors can be applied by the system, even SMD type sensors have been mounted to PCBs with pins for easy evaluation. The only prerequisite for applying EK-H2 is a computer.

It must be emphasized that EK-H2 has been developed for demonstration and evaluation purposes. It has not been certified for calibration or measurement purposes. In extreme environments, failures may occur that would happen to mere sensors. For precise measurements please apply the evaluation kit EK-H3 – please refer to the datasheet on www.sensirion.com/humidity.

SHTxx humidity sensors provided by Sensirion are fully integrated relative humidity and temperature sensors with calibrated digital output. The integra-

tion of sensor and readout circuitry on a single chip leads to an excellent price to performance ratio and high reliability. Additionally, the sensor system combines relative humidity and temperature measurement which allows for precise dew point determination. The linear output signal is fully calibrated and allows sensor components to be exchanged without additional calibration. Moreover, its digital output provides simple access to the sensor signal. For further information on the SHTxx humidity sensors please refer to the datasheet available on www.sensirion.com/humidity.

In addition to the SHTxx humidity sensors the evaluation kit EK-H2 further contains filter caps SF1, useful for mounting onto SHT1x sensors. SF1 filter caps protect the sensor against dust and other contaminants and may be mounted into a wall of a device housing. For further information and technical details on the filter cap SF1 please refer to the respective datasheet.



Figure 1: Evaluation Kit EK-H2 with contents

1 Contents of EK-H2

Nr.	Content
(1)	Sensor Components: 2 x SHT11 SMD type sensor, mounted to PCB with pins 2 x SHT15 SMD type sensor, mounted to PCB with pins 2 x SHT75 Pin type humidity & temperature sensor 4 x SF1 Filter cap
(2)	Sensor Interface Cable
(3)	Serial Interface Cable
(4)	Power Supply
(5)	Microprocessor Board ASD11 (incl. LCD and RS-232 Interface)
(6)	Humi Viewer (V3.0) Software on CD
(7)	Palm Software on CD suitable for Palm III & V
(8)	Adapter




Table 1: Contents of the evaluation kit EK-H2.

Please note: All sensor components may be of version 3 or version 4 (V3 and V4) - V3 sensors were produced on 4" wafers whereas V4 sensors were produced on 8" wafers. For further information please contact Sensirion. Eventually all sensors will be V4. The Version can be distinguished by the tracking number on the sensor cap: V3 is strictly numeric whereas the code on V4 is alphanumeric.

2 Getting Started

Make sure the following items are available before installing hardware and Humiview software for Windows 2000/NT/XP:

- _ Windows 2000/XP or Windows NT version 4.0/SP6
- _ An idle serial interface port (e.g. COM1)
- _ Humiview (V 3.0) software for Windows 2000/NT/XP on CD
- _ Contents of your evaluation kit as described in section *Introduction*

In case no CD drive is available and Humi Viewer software needs to be provided on floppy disk – please contact Sensirion.

3 Installation of Hardware

For setting up the hardware components the following steps need to taken – for easier understanding compare also Figure 2:

Nr.	Action Item
1.	Turn on the computer and start Windows 2000/NT/XP.
2.	Connect the serial interface cable with the COM port of the computer (the configuration of the serial interface is displayed at Appendix A).
3.	Connect the interface cable to the ASD11 microprocessor board using the serial interface connector (pin diagram of the ASD11 is given in Appendix A).
4.	Plug in the power supply. Input 100V - 240V AC, 47Hz - 63Hz.
5.	Connect the SHTxx sensor component to the ASD11 microprocessor board using the sensor interface cable.
6.	Important: Please make sure all components are properly connected.

The EK-H2 system is now ready for measurement. For detailed description of ASD11 microprocessor board, including jumper settings, a command summary, and a pin diagram of the serial interface, please consult Appendix A.

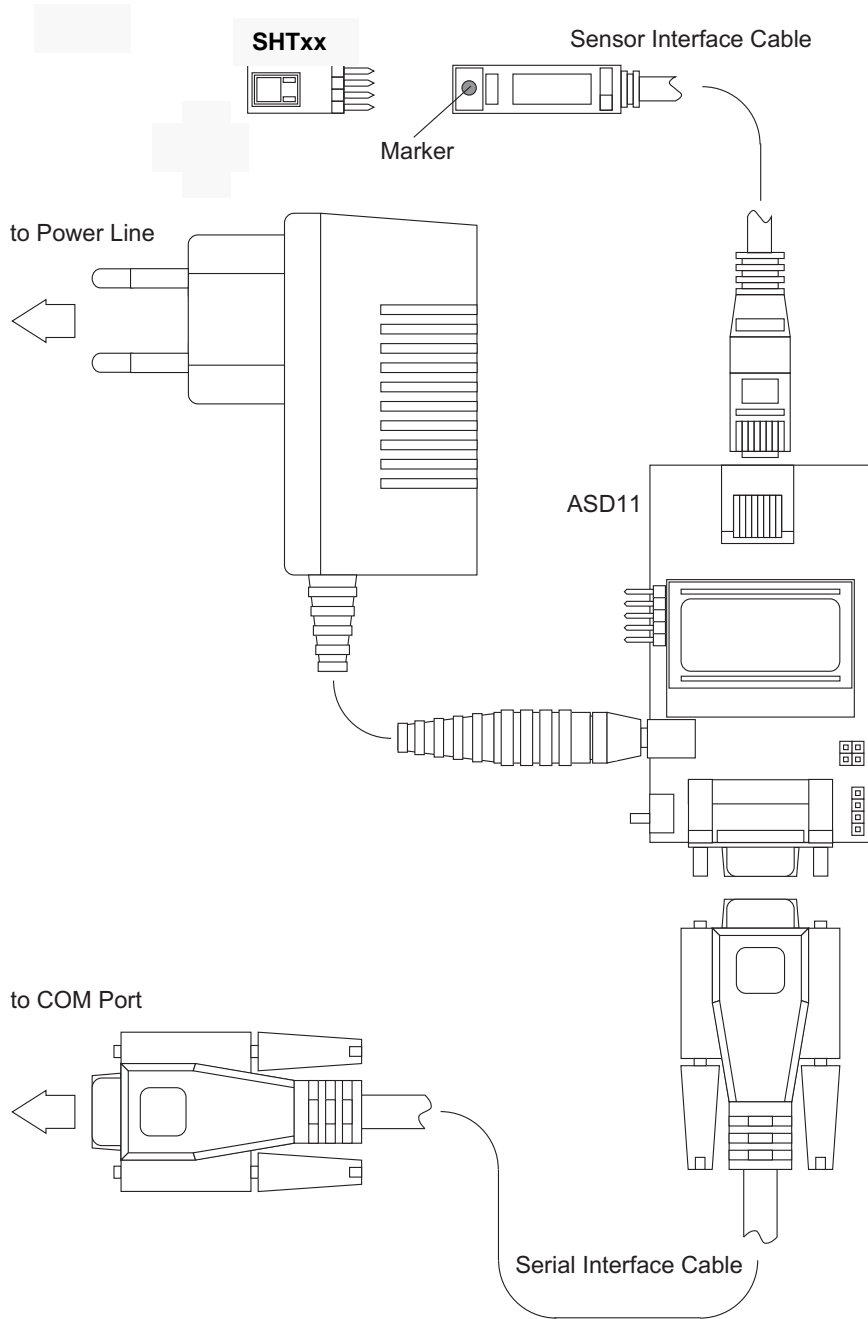


Figure 2: General measurement setup for EK-H2.

4 Installation of Software und Start-Up

After installation of SHTxx / ASD11 hardware, the following steps for the installation of the Humi Viewer V3.0 software for Windows 2000/NT/XP need to be taken:

Nr.	Action Item
1.	Insert the CD with the Humi View V3.0 software for Windows 2000/NT/XP.
2.	Open the "DISKS" file on the software CD, then double-click "SETUP.EXE" and follow the instructions of the installation wizard.
3.	Double-click the "Humi_Viewer_V3_0" icon on the desktop to start the application.

Note: If the program does not display any units this may have to do with the regional setting of decimal symbols.

For a detailed description of Humi Viewer V3.0 software please refer to next section.

Please note: This software is copyright and intended exclusively for demonstration and evaluation purposes. It may not be used or copied commercially. Any warranty claims will be rejected.

5 Running Humi Viewer (V3.0)

To start the Humi Viewer, double click the Humi Viewer icon on the desktop. A pop-up window appears and helps to properly setting the COM port with the connected SHTxx/ASD11 (see Figure 3). If the SHTxx / ASD11 cannot be linked to the Humi Viewer, please re-check all connections of the system.



Figure 3:
Pop-up window for proper connection of the SHTxx/ASD11 to the Humi Viewer.

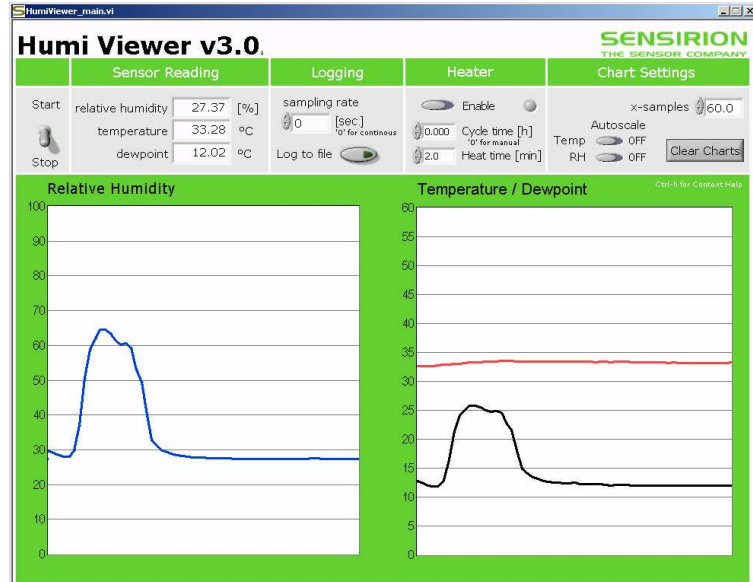


Figure 4: Main window of HumiViewer to display measurement data of the SHTxx.

Once the connection has been made the Humi Viewer main window will appear (see Figure 4). Start measurements by clicking the *START* button and interrupted it by the *STOP* button. The speed of data acquisition is set by *sampling rate* (values in seconds). *LOG TO FILE* allows for saving measured data in a text file.

Optionally, the SHTxx on-chip heater can be enabled. A cycling time and a heating period (i.e. minutes the heater is turned on and off, during total cycling time) can be defined. The heater will increase sensor temperature typically by 5°C [9°F] to 10°C [18°F].

Appendix A: ASD11 microprocessor board

The ASD11 microprocessor board is used for processing the digital output signal of the SHTxx. There non-linearity and temperature dependencies are adjusted as described in the datasheet. The signal then is transmitted to the computer by RS-232 interface. The board is shown in Figure 5 with corresponding settings of the jumpers. The serial connector of the microprocessor board is a 9-pin female D-SUB connector and can be connected to any serial COM port (9600 baud, 8 data bits, 1 stop bit, no parity, no protocol).

	Settings Jumpers A		
	default	open	closed
A1	open	Celsius display	Fahrenheit display
A2	open	Calculates real values	Raw values
A3	open	reserved	reserved
A4	open	Relative humidity and temperature	Dew point and temperature
A5	open	-	reset system (rising edge)

wiring inter- face connector	Settings Jumpers B	
	position B1 (default, typical for PC)	position B2 (crossed, typical for PDA)
pin 2	receive data RxD	transmit data TxD
pin 3	transmit data TxD	receive data RxD
pin 5	signal ground GND	signal ground GND

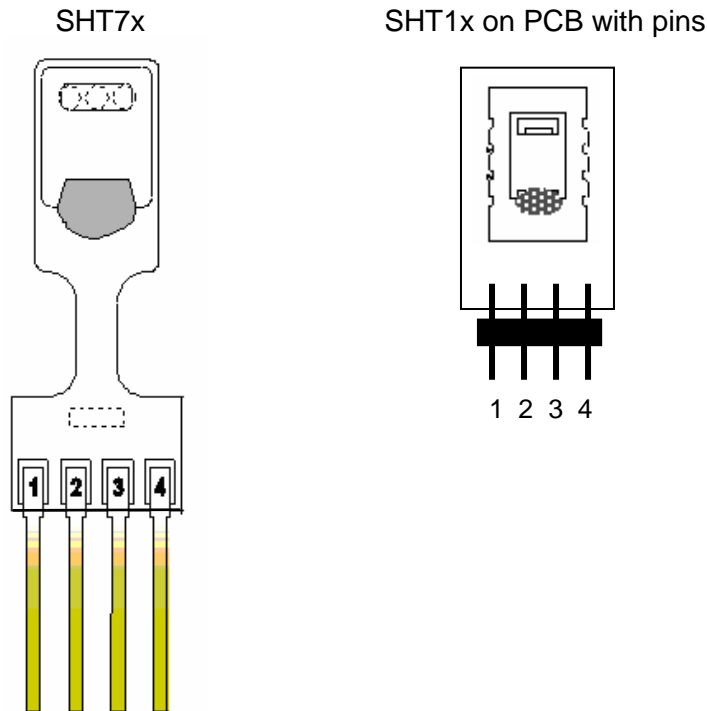
Figure 5: Microprocessor board with its corresponding jumper settings. B1 direct, not crossed for PC, B2 crossed for PDA.

Die Microprocessor board ASD11 can also be used with any terminal program (e.g. HyperTerminal, VersaTerm,). The following section summarizes the commands available to control the ASD11:

HELP	Short help text
VER	Provides the version of the sensor software
GET	Starts a single measurement given as SPI value
GO	Starts continuous measurement
S	Stops measuring
MOD=[H;D]	H: Relative humidity and temperature on serial output D: Dew point and temperature on serial output
RAW=[0,1,D]	0: ASD11 calculates real values 1: ASD11 forwards raw data from sensor D: Calculates values after "GO" raw values after "GET"
REGW=[yy]	Writes hex value yy into SHTxx status register
REGR	Reads SHTxx status register

Each command has to be confirmed by the *Enter-Key*, the commands are not case sensitive.

Appendix B: Pin Diagram SHTxx



Pin	Name	Comment
1	SCK	Serial clock input
2	VDD	Supply
3	GND	Ground
4	DATA	Serial data bidirectional

Figure 6 Pin description SHTxx

6 Revision history

Date	Revision	Changes
4.10.2006	3.1	Sensirion Inc. address added
30.10.2006	3.2	SHTxx on-chip heater feature explained
27.05.2008	4.0	Add comment on Version 3 and 4, cosmetics

All datasheets and application notes can be found at: www.sensirion.com/humidity

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.

This warranty does not apply to any equipment which has not been installed and used within the specifications recommended by SENSIRION for the intended and proper use of the equipment. EXCEPT FOR THE WARRANTIES EXPRESSLY SET FORTH HEREIN, SENSIRION MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT. ANY AND ALL WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY EXCLUDED AND DECLINED.

SENSIRION is only liable for defects of this product arising under the conditions of operation provided for in the data sheet and proper use of the goods. SENSIRION explicitly disclaims all warranties, express or implied, for any period during which the goods are operated or stored not in accordance with the technical specifications.

SENSIRION does not assume any liability arising out of any application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages. All operating parameters, including without limitation recommended parameters, must be validated for each customer's applications by customer's technical experts. Recommended parameters can and do vary in different applications.

SENSIRION reserves the right, without further notice, (i) to change the product specifications and/or the information in this document and (ii) to improve reliability, functions and design of this product.

Copyright© 2001-2005, SENSIRION.
 CMOSens® is a trademark of Sensirion
 All rights reserved.

Headquarters and Sales Offices

1. Headquarter

2. SENSIRION AG
 Laubisruetistr. 50
 CH-8712 Staefa ZH
 Switzerland

Phone: + 41 (0)44 306 40 00
 Fax: + 41 (0)44 306 40 30
info@sensirion.com
<http://www.sensirion.com/>

Sales Office USA:

SENSIRION Inc.
 2801 Townsgate Rd., Suite 240
 Westlake Village, CA 91361
 USA

Phone: 805 409 4900
 Fax: 805 435 0467
michael.karst@sensirion.com
<http://www.sensirion.com/>

Sales Office Korea:

SENSIRION KOREA Co. Ltd.
 #1414, Anyang Construction Tower B/D,
 1112-1, Bisan-dong, Anyang-city
 Gyeonggi-Province
 South Korea

Phone: 031 440 9925~27
 Fax: 031 440 9927
info@sensirion.co.kr
<http://www.sensirion.co.kr>

Sales Office Japan:

SENSIRION JAPAN Co. Ltd.
 Postal Code: 108-0074
 Shinagawa Station Bldg. 7F,
 4-23-5, Takanawa, Minato-ku
 Tokyo, Japan

Phone: 03 3444 4940
 Fax: 03 3444 4939
info@sensirion.co.jp
<http://www.sensirion.co.jp>

Find your local representative at: http://www.sensirion.com/en/03_contact-sales/00_contact_us/02_representatives.htm