

Evaluation Kit EK-H2

Humidity & Temperature

Version 3.0

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Introduction

Humidity sensors provided by SENSIRION AG represent a new generation of fully integrated relative humidity and temperature sensor systems with calibrated digital output. This integration of the sensor and readout circuitry on a single chip leads to an unbeatable price performance ratio and high reliability. Additionally, the sensor system features combined relative humidity and temperature measurement. The linear output signal is fully calibrated and allows sensor systems to be interchanged without additional calibration. Moreover, its digital output provides simple access to the sensor signal (plug and play). For further information on the humidity sensors SHTXY please refer to the datasheet.

The hardware which is included supports all humidity sensors provided by SENSIRION AG and was developed for evaluation and reference design. It has therefore not been tested nor qualified for the same high standard of quality as the humidity- and temperature sensors SHTXY. In extreme environments, failures that would not be caused by the sensor devices may therefore occur.

In addition to the humidity sensors SHTXY the evaluation kit EK-H2 also contains the filter cap SF1, useful for mounting the SHT1x sensors directly into the wall of a housing and to protect it against dust and other contaminants in very harsh environments. For further information and technical details on the filter cap SF1 please refer to the datasheet.

The humidity evaluation kit offers an easy-to-use environment to illustrate the unique features of the sensor system and to adapt it to your specific application. The contents of the kit are shown in *Fig. 1* and listed in *Tab. 1*. It includes a set of two SHT11, two SHT15 and two SHT75 sensors, four filter caps SF1 for the SHT1X, the ASD11 microprocessor board (with LCD), a serial interface cable, a sensor interface cable and a power supply.



Fig. 1: Photograph of the evaluation kit and contents.

- | |
|---|
| <ol style="list-style-type: none">(1) sensor systems (2 x SHT11, 2 x SHT15 & 2 x SHT75) + 4x filter cap SF1(2) sensor interface cable(3) serial interface cable(4) power supply(5) microprocessor board ASD11 (incl. LCD and RS-232 Interface)(6) Humiview (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.

1 What You Need to Get Started

Make sure you have all of the following items before you install the hardware and Humiview software for Windows 2000/NT/XP:

- _ Windows 2000/XP or Windows NT version 4.0/SP6.
- _ An unused 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 the *Introduction*.

If you do not have a CD drive and would like to order the Humiview software on a floppy disk, please contact Sensirion AG.

2 Installing the Hardware

In the following section, all the necessary electrical interconnections for the SHTXY sensor system will be listed. These connections are required between the SHTXY, the ASD11 microprocessor board, a PC serial interface, and a power supply.

Observe precautions when handling electrostatic sensitive devices!



To install your SHTXY hardware, complete the following steps (*see Fig. 2*).

- _ Turn on your PC and start Windows 2000/NT/XP.
- _ Connect the serial interface cable with the COM port of your PC (configuration of the serial interface see *App. A*).
- _ Connect the interface cable with the ASD11 microprocessor board using the serial interface connector (pin diagram of the ASD11 is given in *App. A*).
- _ Plug in the power supply. Input 100V - 240V AC, 47Hz - 63Hz.
- _ Connect the SHTXY sensor system to the ASD11 microprocessor board using the sensor interface cable.

Important: ensure you have the proper connection between sensors system SHTXY and the interface cable.

The SHTXY sensor system is now ready to measure humidity and temperature. In *Appendix A*, a more detailed description of the ASD11 microprocessor board is given, including jumper settings, a command summary, and a pin diagram of the serial interface.

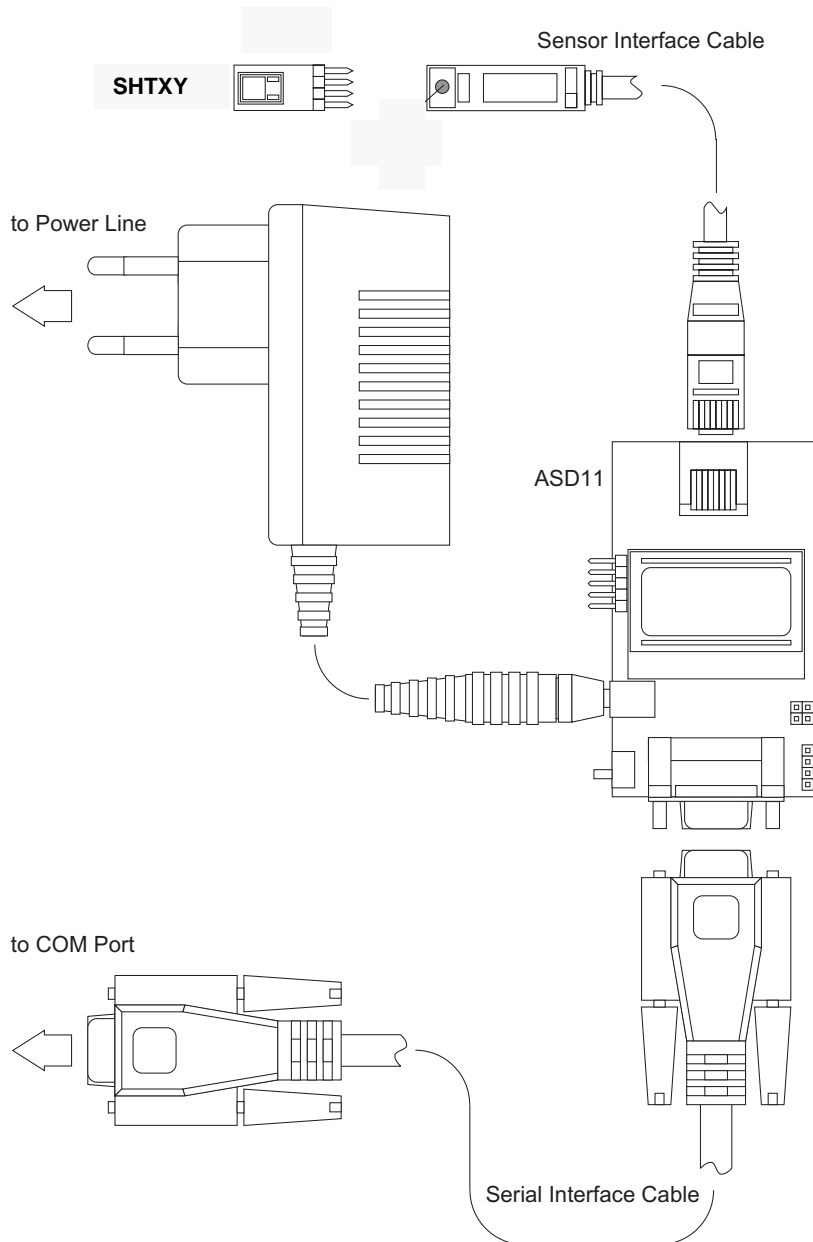


Fig. 2: General measurement setup for the EK-H2.

3 Installing the Software und Start-Up

After having installed the SHTXY/ASD11 hardware, complete the following steps to install the Humiview V3.0 software for Windows 2000/NT/XP on your PC:

- _ Insert the CD with the HumiView V3.0 software for Windows 2000/NT/XP.
- _ Open the "DISKS" file on the software CD, then double-click "SETUP.EXE" and follow the instructions of the installation wizard.
- _ Double-click the "Humiview_V3_0" icon on your desktop to start the application.
- _ Note: If no units are displayed in the program it may be that your decimal symbol in the "Regional Setting Properties" is wrong.

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

Please note: This software is copyright and intended exclusively for demonstration and laboratory purposes. It may not be used or copied commercially. SENSIRION AG does not offer any guarantee.

4 Description of Software for Humiview (V3.0)

In order to operate the SHTXY, dedicated software is provided with your evaluation kit. Although the software allows *plug-and-play*, some additional remarks will be given.

To start the Humiview, double click its icon on your desktop. A pop-up window will appear to guide you to the proper setting of your COM port with the connected SHTXY/ASD11 (see Fig. 3). If the SHTXY/ASD11 cannot be linked to the HumiViewer, please check all your connections between the sensor and your system.

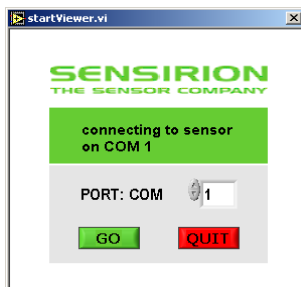


Fig. 3: Pop-up window for proper connection of the SHTXY/ASD11 to the Humiview.

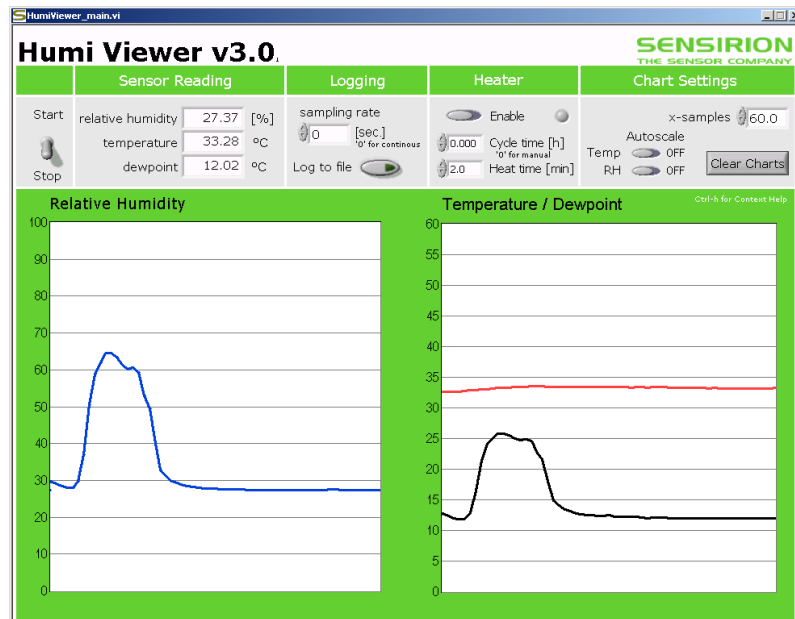


Fig. 4: Main window of HumiViewer to display measurement data of the SHTXY.

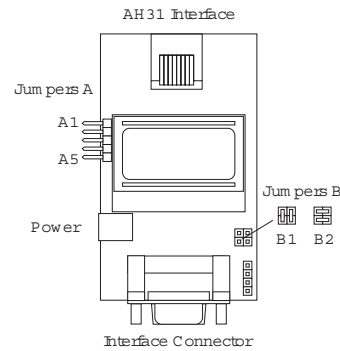
Once the connection has been set up, the HumiViewer main window will appear (see Fig. 4). Measurements are started with the *START* button and interrupted with the *STOP* button. The speed of data acquisition is set by *sampling rate (SECONDS)*. *WRITE TO OUTPUT FILE* allows measured data to be saved in a text file.

5 Appendix A: ASD11 microprocessor board

With the ASD11 microprocessor board, the digital output signal of the SHTXY is recorded and adjusted for non-linearity and temperature dependency as described in the datasheet. It can then be transmitted to your PC by RS-232. The board is shown in *Fig. 5*. with the 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		
	de-fault	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	Dewpoint and temperature
A5	open	-	reset system (rising edge)

wiring interface connector	settings jumpers B	
	position B1 (default, typical for PC)	position B2 (crossed, typical for PDA)
pin 2	receive data <i>RxD</i>	transmit data <i>TxD</i>
pin 3	transmit data <i>TxD</i>	receive data <i>RxD</i>
pin 5	signal ground GND	signal ground GND



B1 direct, not crossed for PC, B2 crossed for PDA.

Fig. 5: Microprocessor board with its corresponding jumper settings.

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

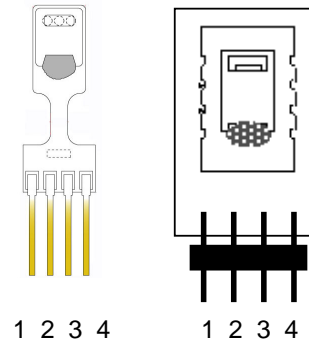
HELP	short help text
VER	provides the version of the sensor software
GET	starts a single measurement given as SPI value
GO	starts continuous measurement
S	stops measuring
MOD=[H;D]	H: relative humidity and temperature on serial output D: dewpoint and temperature on serial output
RAW=[0,1,D]	0: ASD11 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.

6 Appendix B: Pin Diagram SHTXY

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

Fig. 6 Pin description SHTXY



7 Important Information

7.1 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. Failure to comply with these instructions could result in death or serious injury.

Should buyer purchase or use SENSIRION AG products for any such unintended or unauthorized application, buyer shall indemnify and hold SENSIRION AG and its officers, employees, subsidiaries, affiliates and distributors harmless 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 such claim alleges that SENSIRION AG was negligent regarding the design or manufacture of the part.

7.2 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 normal ESD precautions when handling this product.

7.3 Warranty

SENSIRION AG makes no warranty, representation or guarantee regarding the suitability of its product for any particular purpose, nor does SENSIRION AG assume any liability arising out of the application or use of any product or circuit and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typical" must be validated for each customer applications by customer's technical experts.

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