OPERATION MANUAL

Humidity- temperature probe with USB-Interface

Description

Characteristics features

- Combined Temperature and Humidity measurement
- Sensor in Stainless steel casing with Sinterfilter
- Resolution 0.01 % RH, 0.01°C
- Accuracy 2 % RH, 0.3°C
- Calibration possibility with salt reference cells

Areas of application

- Monitoring of stock rooms, in quality assurance or air conditioning systems

Windows-Software

- Calculation and display of dew point, abso-lute humidity, vapour pressure, saturated vapour pressure and enthalpy
- Tabular representation of measured values
- Storing of data on hard disk

Technical data

Humidity measurement	
Humidity measuring range	0 ... 100 % RH
Humidity resolution	0.01 % RH
Typical accuracy	±2 % RH (at 23 °C)
Temperature measurement	
Temp. measuring range	–40 ... 80 °C
Temperature resolution	0.01 °C
Accuracy	±0.3 K between 0 and 40 °C
Module	
Power supply	Over the USB port
Operating current	Approx. 30 mA
Interface	USB-interface, 1.1 und 2.0 compatible
Probe dimensions	150 x Ø12 mm
CE-conformance	2014/30/EU
EMV-noise emission:	EN 61000-6-3:2011
EMV-noise immunity:	EN 61000-6-2:2011
Scope of supply	Humidity probe in stainless steel casing, interface adapter with USB-connection cable and extensive documentation
Article number	HYTELOG-USB

Description

The product offers an efficient measurement and display system for temperature and relative humidity. The compact measuring probe with overall dimensions of Ø12 x 150 mm is housed in a stainless steel casing. The scope of supply includes a port converter, which enables direct operation through the USB port of a PC.

The front area of the sensor is provided with a polyethylene-sinter filter for protection against sprinkling water and mechanical damages. An accurate NTC has been used as temperature sensor. The humidity measurement operates with a long term stable, capacitive polymer sensor.The micro controller of the port converter compensates the linearity error and temperature drift of sensor elements. The high quality polymer sensor guarantee outstanding measuring accuracy and long-term stability, also under extreme operating conditions.

The current measured values are transferred to the connected PC through the USB interface. The display and graphical representation of the measured values appear on the PC. The easy to use Windows software for display of measured values and data representation is for free in our download center.

The USB driver software emulates a serial COM-port. The ASCII-protocol for data communication is documented and enables integration with user's own developed programs. The probe is supplied in calibrated condition. With the help of reference cells available as accessories, the accuracy of the probe can be checked by the user himself. Further calibration and adjusting the scale is also possible.

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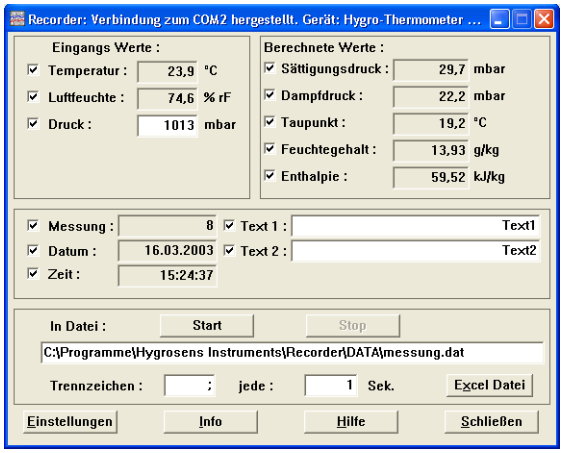
WINDOWS-Software RECORDER

With the help of this program the measured values can be received through the USB-interface and displayed on the PC. The displayed file is compatible with any desired spreadsheet program, with which it is possible to further process, statistically evaluate or visualise the measurement data.
In addition, the PC-Software also calculates dew point, absolute humidity, enthalpy and vapour pressure from the measured values of relative humidity and temperature. The calculated figures can also be stored.



View of the Software “RECORDER“

System requirements
Windows 98, 2000 or XP, RS232 or USB-interface. Generally, older PCs are also suitable.
Important hint: First connect the USB-Version to the PC after installing the software. This simplifies driver installation and enables “Plug&Play“ feature.

Installation
Download: bb-sensors.download/en

First time operation
Connect the humidity meas-uring system to the USB-interface of a PC. After first time run of the software, go to menu option „settings“ and select device type as „HYTELOG 4800Bd“ and also select the type of interface to be used under „connections“ (Note: For USB-version, mention the virtual COM-port specified during driver installation). The remaining settings (Data rate, Parity, Start and Stop bit) are automatically selected and need not be changed. If the connection is established, the data communication appears on the terminal window. Then select „Close“. The current settings will be stored.

If you are not able to establish data link between PC and the measuring device or the measuring adaptor, then first please check the power supply and also cable connection to the PC. Further in-formation on debugging is available under FAQ´s on the CD or at our Homepage under SUPPORT.

Data recording
First activate all the hooked up measurement channels that are to be recorded. In ‚Text 1‘ and ‚Text 2‘, you can enter a description, which has to appear as heading on the top of data file. The data is recorded in a file, which is de-clared as path in the ‚Start‘ button. The recording begins with the ‚Start‘ button.

EXCEL™
The created file is compatible with CSV-Format. In order to display the measured data, you can use graphic tools, for example, the diagram-assistant. However, other programs can also be used to graphically represent or evaluate the measured data.

Calibration

The humidity probe is supplied in calibrated condition. The accuracy at 23°C is of the order of ±0.3° K and ±2 % RH. Under normal operating conditions, it is not necessary to again calibrate the probe. The cross che cking of measuring accuracy of the humidity measure ment part can be done by end user with the salt refe rence cells available as special accessories. The cross checking must be done in temperature stable environment. In case, the measured value does not match with the reference value of the cell, the device should be sent to our calibration laboratory for check-up.

Format of Data transfer

The USB-port works as a so-called COM-Port emulation and from a programmer‘s point of view, it behaves like a serial interface.
The transfer of useful data takes place in lines. All characters are ASCII coded. All information is sent continuously without separation characters. In one line, only information of one channel is transferred. At the end of the line, the last two ASCII characters are sent for the check sum(CRC) of the current line. Each line closes with the character ‘Carriage return’ ‘<CR>´. Several lines form a data-block. A data-block can have the following contents, for example:

```
@<CR>
```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```
I01010100B00725030178<CR>
V010892A1<CR>
I02020100B00725030148<CR>
V0216B0EA<CR>
$<CR>
```

The data block has a following structure:

- A synchronization pattern for the beginning of a Data block. For synchronization, the sequence ´@ <CR>´ is used.
- The configuration data (´Identifier´) of a channel. The data line begins with the character 'I', followed by the logical channel number, and then followed by configuration data and the sensor serial number. The line is closed with the check sum and the character '<CR>'.
- The measured values of a channel. The data line begins with the character ´V´, followed by the logical channel number, followed by useful data. Only numerical measurement values and the check sum (CRC) at the end of the line, are transferred. All other information like number format, number of characters, physical unit, etc. are contained in the configuration data (probe code).
- The configuration data and measurement values follow the same scheme for all other channels.
- The continuation character ´$´ <CR>´ is sent at the end of a data-block.

Structure of configuration data line

- The configuration data line contains all infor-mation of the sensor working on the corre-sponding channel. The line has a following structure:
- Identification character ´I´ at the beginning of the line.
- 8 bits (two ASCII characters) logical channel number. The logical channel number is used to co-relate configuration data with the measured values. In the Humidity-Temperature module, the temperature values are transmitted through channel 01 and humidity values are transmitted through channel 02.
- 8 bits (two ASCII characters) physical probe coding. Based on probe coding, the number format, scale, physical unit and allowable range of values are specified. For the described device, probe coding is 01 for temperature channel and 02 for humidity channel.
- 8 bits (two ASCII characters) hardware coding (type of the measurement probe). The Tem-perature/Humidity module has the code num-ber 01.
- 48 bits (twelve ASCII characters) serial number of the sensor. Each serial number is allotted only once.
- 8 bits (two ASCII characters) CRC (check sum)
- ´<CR>´ as line termination

Structure of measured value data lines

The measured value data line contains the current measurements of the sensor operating on the corresponding channel. All information is represented in binary and is transferred in ASCII coded format without separation characters. For the probe code 01, the line has following a structure:

- Identification character ´V´ at the beginning of the line
- 8 bits (two ASCII characters) logical channel number (01 for temperature, 02 for humidity)
- 2 Byte (4 ASCII-characters) measurement data. For the temperature with 0.01°C resolu-tion. The hexadecimal value is to be converted into a decimal number and to be divided by 100. With this, the temperature value is ob-tained in °C with two decimals. For humidity value with 0.005 % resolution. The hexadecimal value is to be converted into a decimal number and to be divided by 200. With this, the relative humidity rH value is ob-tained in % with two decimals.
- 8 bits (two ASCII characters) check sum (CRC)
- ´ <CR>´ as line termination

In the example given in opposite column, the measured temperature is equal to 21.94° C and humidity of air is 29.04 % RH.

Accessories (Optional)

Software PCLOG

Besides storing data on hard disk, the software offers a very important feature of graphical repre-sentation of all measured and recorded channels in the form of humidity and temperature Vs time chart (online scriber function). By means of Drag & Click, the window section can be enlarged and the time or temperature axis can be scaled as desired. Besides the graphic view, representation is also possible in the form of a table. The in-between space is used for capturing measured data series into a spreadsheet program (for example EXCELTM) or for word processing. All tables and graphic representations can be printed out in colour. In addition, simple monitoring and control functions are also integrated in the software. Limits can be set for each channel. An acoustic signal (Wave file) is given out when the values are exceeded. Control of up to eight external users is possible by a relay card, which is to be attached at the parallel port.
A speciality of the program is the integrated hx-calculator. This calculates further fifteen parameters like dew point, absolute humidity, enthalpy, the wet bulb temperature, the vapour pressure and saturated vapour pressure etc. from the measured values of relative humidity and temperature.

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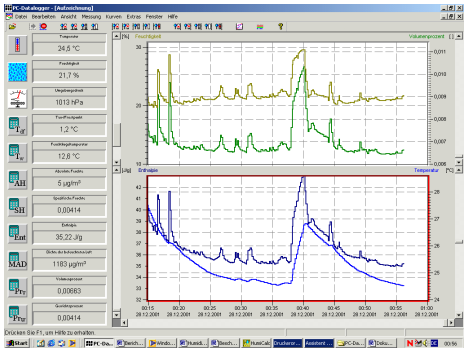

Software Profilab

With this software, professional measurement projects can be carried out in a simple, graphical development platform. You can simply draw the wiring diagram of the measurement circuit and do the project design. Without any knowledge of programming, the measurement values of temperature and humidity can be easily used in the measurement circuit. Arithmetic and logical components take care of linking and processing of the measured values. Modules like impulse generators, timers and relay cards etc. provide extensive possibilities for control and regulation. Various instruments, scribers and tables serve as the storage and representation of measured values and you can monitor the measurement system with display and control elements. The system is operated through a self designed front panel, on which you can arrange switches, potentiometers, displays, LED´s, instruments etc. The software also enables compilation of the project into an EXE-file, which can run without “Profilab“.

Relay cards

The output of control information is given by the WINDOWS software „PCLOG „ or „PROFILAB“ over the USB-Port. The relay cards, available as accessories, are needed for giving connection for heavier loads like heater valves, servomotors or signal generators. The switching status of output is indicated through LEDs. The relay boards can also be used for many other applications.

Humidity reference cells

The B+B Humidity reference cells provides specific humidity conditions, in order to create stable humidity values for experimental purposes or for calibration of the measuring device. The accuracy possible under stable temperature environment conditions is in the range of 1% relative humidity. The working principle is based on a saturated salt solution, over which a specific relative humidity value adjusts itself. The cells also contain a semi-permeable Teflon membrane (diaphragm) through which the salt solution is separated from the measurement area.

Ordering number catalogue

USB-Humidity-Temperature probe with stainless steel sensor	HYTELOG-USB
RS232-Humidity-Temperature probe with stainless steel sensor	HYTELOG-RS232
Handy measuring instrument with LCDisplay wirh USB and Dew point and Absolute humidity display	HM309-USB
Power supply unit	N-12V-670mA
Windows-Software	0141 0318-30
Windows-Software PROFILAB EXPERT	PROFILAB
Humidity reference cells-set, Saturation 33% und 75 %	REFZ-12Z-SET1
Humidity reference cells, various values	On request

Attention

Please avoid extreme mechanical and inappropriate exposure.

The device/product is not suitable for potential explosive areas and medical-technical applications.

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