



Data logger for temperature and relative humidity

by Uwe Lohmann

There are various types of PC based electronic data recording devices and data loggers available in the market. However, we are introducing here thermo/hygro data loggers with low hardware requirements and extensive special functionalities.

The Purpose

In order to guarantee a consistent product quality, it is necessary to maintain a steady temperature and humidity in production shops, storerooms, dust proof chambers and laboratories. Even if a direct air conditioning is not mostly envisaged, a central monitoring system to maintain climate conditions within certain limits is often desired. Effect of room climate on product quality is also revealed even after long time periods. The operation of measuring instrument must be very simple and at the same time, the operating costs should also be very less. Moreover, it is also expected that on the spot calibration should be possible by the operating personnel themselves.

The Hardware

The main backbone of the new HygroSens Data logger is a multi-function PC card in which 8 relay driver outputs for integrated control function are also available besides the regular 16 frequency measuring channels for galvanically isolated sensors. All approved sensors of the series 1307, 1310 and HT 51 can be used. The very small size, combined humidity temperature sensor type 1307 in SMD-construction is of course temperature compensated. Because of its dew resistant functioning, the measuring range lies from 0-100% rH. The wide temperature measuring range of -40 °C to 80 °C, frankly leaves back no further expectations. The hardware requirements for the IBM compatible PC, necessary for the system, are very low and even an outdated 286 machine can be used back for setting up a high quality measuring system.

The Software

The DOS operating system has proved itself to be very reliable and stable in comparison to many window based systems. Users, who were so far dependent on tedious interpretation of graphic curves and conversions, have now a simple game. For each measuring point, apart from temperature and relative humidity, the values of vapour pressure, saturated vapour pressure, absolute humidity, dew point and enthalpy are also directly displayed. Even calculation of material humidity has been considered for measuring, recording or controlling the drying or storage condition of powders, granules or other products. Two moving average values and a MIN/MAX value storage also facilitates statistical analysis.

All measurement data are stored on the selected data storage device e.g. hard disk, floppy disk or flash card. For process records, a printout can be taken whenever required, even with own header



details. Further processing of numeric ASCII-measurement data can also be carried out in a spread sheet program or a higher end software. Remote access of measurement data is also possible through a modem.

Regulation / Limit monitoring

For implementation of warning functions or complex control procedures e.g. in drying process of granulates or pellets, the upper and lower threshold values can be independently configured for triggering of up to a maximum of eight relays. An acoustic alarm over the PC loudspeaker is given out on exceeding any limit.

Conclusion

For climate study tests, in laboratories, research, industry and pharmacy, where a large number of measuring points are to be monitored and recorded, the Thermo-Hygro data logger of HygroSens is a perfect alternative to mechanical thermographs.

About the author



Uwe Lohmann, electrical engineer in the field of measuring systems, has been specialising in humidity and dew point measurement since 1998.

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