Short description

The data loggers of the series DA_MW2E are used for the high-precise, automatic data recording for longer periods of time. Different types of these instruments are available, equipped with 8 up to 16 measuring channels. Most of all current sensors can be directly connected to each measuring channel: Load cells, deformation transducers, sensors for pH-value and oxidation-reduction potential, temperature sensors, electrical current and voltmeters, etc.

The measuring procedure is controlled by a microprocessor, together with a real-time clock. The measuring values are held in a permanent memory and can be transferred, if desired, by a serial interface to a (portable) personal computer. The processing, visualization and evaluation of the data can be done with nearly all current standard programs (spread sheet calculation, data bases, etc.).

Design

The data logger consists on principle of three function blocks (Fig. 1).

1. Analog/digital-converter block

This block delivers the raw measuring data. The sensor of a measuring channel can deliver a signal referring to mass or differential signal. Differential means that the signal must not have a reference to mass, but that the measuring value can be seen as a difference between both conductors. Differential signals are often produced by strain foil gauges, for example. This signal is pre-amplified by an „instrument amplifier“ and led to the A/D-converter, which turns an electrical value to a digital value with a resolution of +/- 18 bit in this case. This corresponds to an accuracy of 0,0004 %! In practice each signal has a certain random noise that corrupts the measuring value in case of individual measurements. To reduce this statistical effect a programmable number of measuring values can be averaged.

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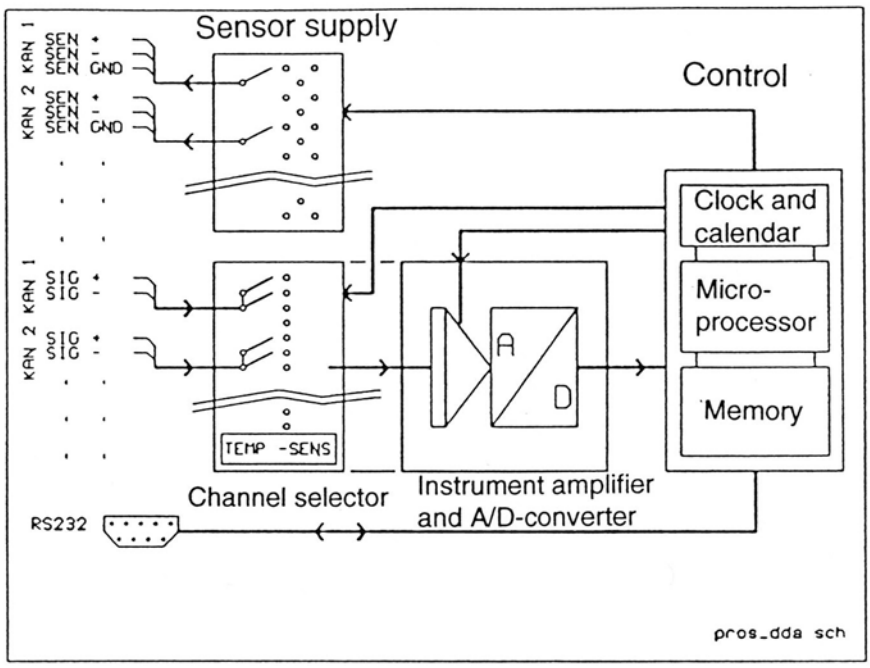

Fig. 1 Scheme of DDA_MW2E

2. Microprocessor control

The microprocessor of the DDA_MW2E controls the complete measuring procedure: time control, calibration of the A/D-converter, selection of a measuring channel, data acquisition, filtering, data preparation, measuring programs, data storing, communication with the connected PC, etc. Together with the real-time clock the microprocessor controls the „wake up“ of the instrument to measure and the electricity-saving „sleeping“ during the pauses. A „watchdog“, that means a circuit to control the function of software and hardware guarantees a reliable working, even in case of great problems (f. e. breakdown or troubles in supply voltage, electromagnetic interferences by lightning-stroke) On demand the realization of special functions of the instrument is possible at short notice by exchanging the program memory.

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3. Terminal block with sensor supply

All sensor connections are at a central printed circuit board. By a flat cable this printed circuit board is connected with the other two function blocks (A/D-converter and microprocessor control), which are in a separate housing. For each measuring channel a switchable sensor supply is available. The sensor supply is possibly necessary to supply active sensors with energy or to feed passive sensors (f. e. strain foil gauges) with reference current. Each measuring channel can be individually adjusted. The microprocessor controls the sensor supply.

Temperature sensor

Normally the surrounding temperature is very important for data recordings. Therefore the standard instruments are equipped with a temperature sensor. When using the temperature sensor one measuring channel is occupied.

Programs for PC

Together with the instrument we deliver programs to adjust the parameters of the DDA_MW2E and to read-out measuring values. The data files prepared with these programs can be imported without problems with all standard data bases and spread sheet calculations. The following example has been prepared with the spread sheet calculation „Excel“ (Fig. 2).

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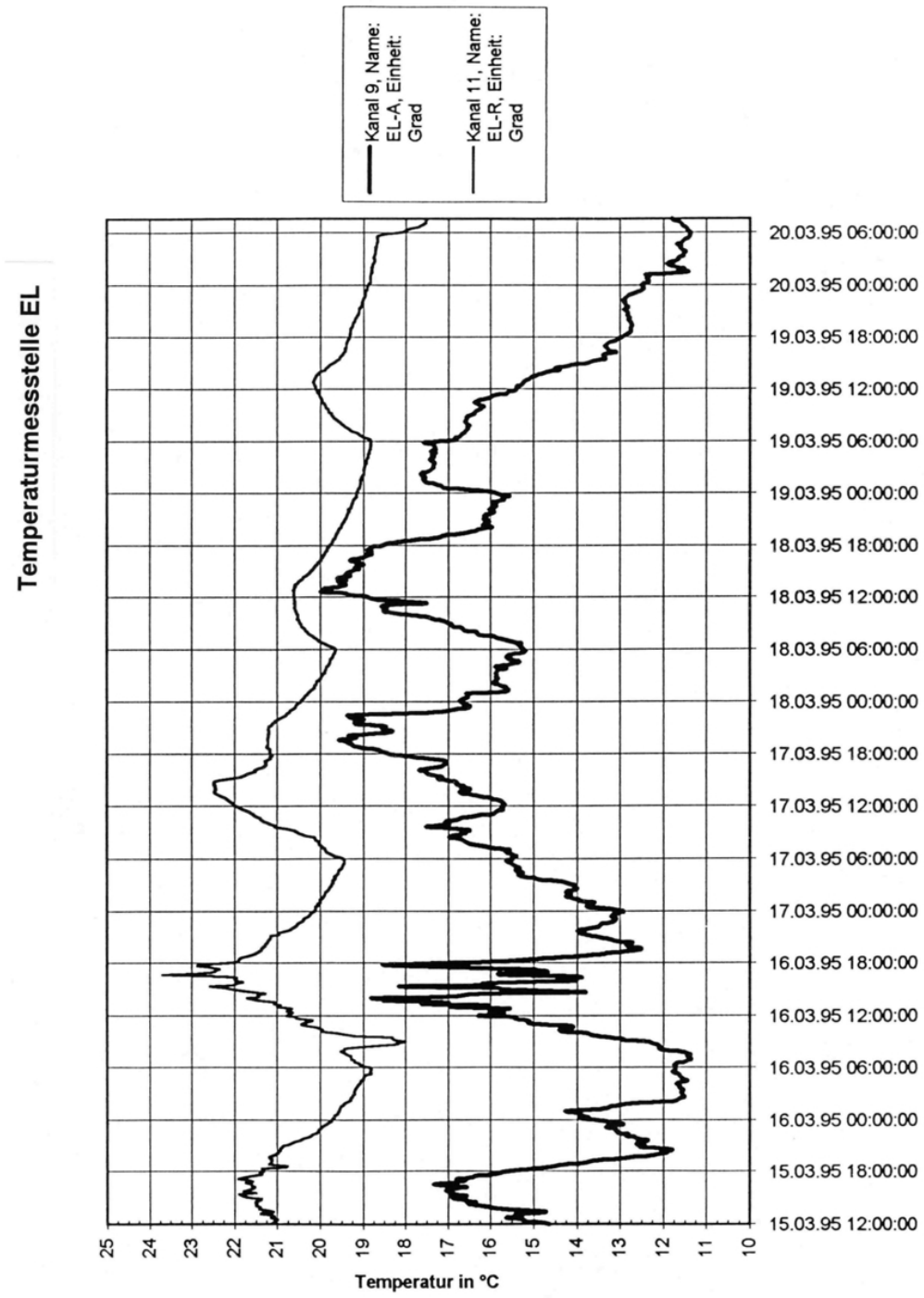

Fig. 2 Example of a graphical evaluation with „Excel“

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