

Temperature Data Logger the size of a credit card

Negligent handling of temperature sensitive goods can have fatal consequences. Of course it is advantageous to control temperatures, however temperature data loggers of the past were often bulky and unmanageable. Now there is a data logger which has been reduced to the size of a credit card.

Goods are not always treated gently during transportation. Shipping businesses are increasingly under intense cost and time pressure; thus the client's stringent requirements requiring the handling of the goods are seldom adhered to. Some commercial merchandise is very sensitive to rough handling and especially to temperatures which are too high or too low: foodstuffs (fruit, meat); pharmaceuticals and vaccines, many of which must strictly comply with cold chain regulations; blood bottles, live organs and livestock. Because it was often difficult to determine at which point in time a temperature violation occurred, a freight forwarding company was easily able to excuse itself from any fault in the event of a damage claim.

The temperature data logger „CellaLog[®]„ makes this a problem of the past: a processor with a temperature sensor, contained within an enclosure the size of a credit card, 4 mm thick and 30 g light, developed by Keller HCW GmbH in Ibbenbüren, Germany. CellaLog[®] can easily accompany the goods during transportation, usually indiscernible to the shipper.



CellaLog in a refrigerator chest

CellaLog[®] —independent of mains power or any bothersome wiring—continuously monitors the temperature and saves the data in regular intervals.

Prior to the start of the datalogging mission, the user programs essential parameters: measurement interval, limit temperatures, mission name/identification, etc. and the mission is then activated.

Once the transported goods have arrived, the receiver can establish what has occurred in regard to temperature. For a quick on-the-spot check the „CellaPen“—magnetic pen can be briefly held to the card.



CellaLog with LED and CellaLogPen

If, during the course of the datalogging mission, the preset limit temperatures were underrun or exceeded, a red LED in the logger card will blink. If the temperature readings were maintained within the permissible range, a green LED will blink. The receiver of the goods can immediately decide whether or not to accept the merchandise. To obtain a detailed analysis of the entire measurement period the datalogger can be inserted into a reading device connected to a PC. The PC monitor will display all recorded temperatures corresponding to the date and time.

Absolutely tamperproof

The computer and electronics industry has painfully come to realise that, in order to protect against loss or damage caused by hackers, security measures must be taken. The use of a CellaLog[®] almost certainly rules out the possibility of data manipulation. The logger card provides a fastening hole so that it can be secured with a lock to deter against theft. Individual, inalterable logger ID numbers make it virtually impossible to fraudulently or mistakenly swap cards. Temperature data is tamper-proof due to fully sealed electronics and a configuration lock-out key. The battery, which lasts up to five years, is completely inaccessible, and thus prevents the possibility of data deletion due to battery removal. CellaLog[®] is mechanically designed to be shock-proof and water-proof. The logger can be employed within liquids or in harsh industrial environments. The integrated real-time clock runs continuously and the logger is maintenance-free during its service life.

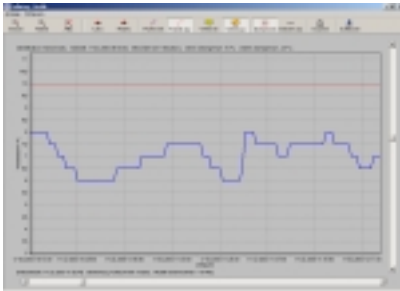
Aside from the shipping business, CellaLog[®] can be used for a wide variety of stationary applications such as within refrigerator or freezer chambers.



CellaLog within a freezer

With temperature-sensitive goods it is crucial to know the temperature range within which the goods were kept, or if an electrical power outage occurred. It is difficult to prevent and/or identify such disturbances when a logger is wired to the mains power supply .

CellaLog® is never susceptible to a power outage. In large refrigerated chambers several loggers can be utilised.



Temperature diagram

In industrial facilities CellaLog® can be placed in hard-to-access locations or areas of limited space such as at inaccessible machines.

The card is practical for one-time measurement tasks because it does not entail any wiring or installation work.

The measurement range of -40 to $+85$ °C and the resolution of 0.5 K cover most common applications. The memory holds up to 2048 data points and offers two modes of operation: the datalogger ends when the memory is filled up, or the logger will overwrite old data to continue logging indefinitely.

The histogram memory records up to 65,535 data samples and shows the number of times specific temperatures were sampled at a resolution of 2°C . Two limit values can be set, when these are exceeded the third memory is used to function as an alarm memory.

The measurement interval can be adjusted between 1 and 255 minutes (4.25 hours). Thus, the datalogging mission can last up to one year. A start delay of up to 65 535 minutes can be programmed. The battery will last at least five years and has a built-in state-of-charge indicator.

Easy Data Analysis.

The „CellaDrive“ reading device is a tool for downloading the recorded measurement data to a PC. CellaLog is simply inserted into the reading device which is connected to the serial interface of a PC. The temperature values including date and time can be viewed at a PC for further analysis.



CellaLog with reading device CellaDrive

An alarm journal is generated and measurement data including temperature violations is archived in a data base.

The dedicated software provides various types of data analysis and archiving. For further processing the data can be expressed in ASCII format and exported to other software applications, e.g. to Excel for spreadsheet analysis.