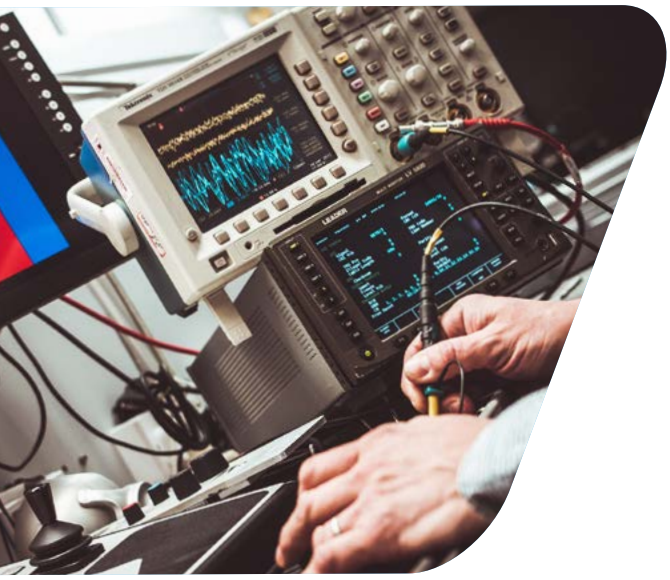
APPLICATION NOTE

CAS DATALOGGERS

Multichannel Data Acquisition System Automates Calibration & Sensor Compensation

Delphin Technology Show Advantages of Automation

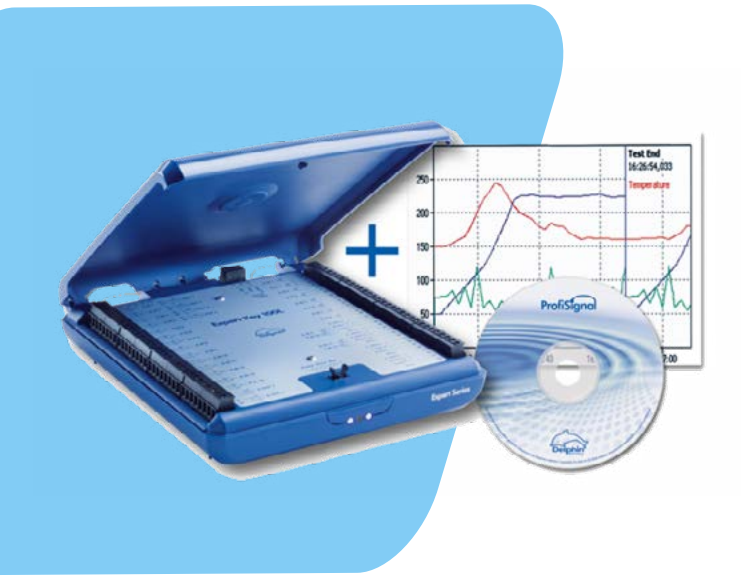


Many of today's measurement requirements involve large numbers of measurement channels and sensors. However, setup and preparation times for these large-scale measurement and testing procedures are often lengthy and can delay project deadlines. In many cases, engineers' measurement results must be traceable, so the calibration of each sensor needs to be known and considered when analyzing data. To significantly reduce the effort required here, Delphin multichannel data acquisition systems has recently extended its ProfiSignal software with new functions enabling users to fully automate calibration and sensor compensation.

Automated Calibration Using ProfiSignal

Delphin ProfiSignal Software gives users direct control over sensor calibration and adjustment via data acquisition trends. ProfiSignal performs basic data archiving, visualization procedures, and enables fully automated systems with report functions. Users can also generate complete applications for calibration. All the functions for automating calibration are then available.

Links to sensor databases are possible via SQL, ASCII or DLL interfaces. Using ProfiSignal it's also easy to implement the management of calibration chambers via an interface. An integrated report generator produces calibration protocols in PDF format at the click of a button.



Delphin's ProfiSignal measurement and testing software give users a full range of functions, an intuitive interface, and high-level data security. ProfiSignal is ideal for data acquisition, test automation and process data acquisition applications, enabling online/offline analysis, visualization and operation from any PC workstation, and PC-controlled process automation/database communications via ODBC/SQL.

All measured values can be transferred to online storage and will work on PCs or servers. Visualization and analysis are performed with the ProfiSignal software or OPC Server using any software.

Common Applications for Sensor Compensation and Calibration:

- Measuring temperature distribution in ovens
- Calibrating process furnaces and thermocouples according to CQI-9
- Determining characteristic curves for electrical potentials
- Analyzing corrosion on ship hulls
- Measuring temperature uniformity
- Determining heating system efficiency
- Thermal analysis of wood-fired furnaces

Measuring Temperatures in Heat Exchangers

Here's a brief example of how Delphin hardware and software can enable high-precision temperature measurement in heat exchangers:

To record reliable data, the RTDs or thermocouple sensors being used must provide precise measurements. However, any sensor will produce deviations, so a quick and easy method of compensation is required. Therefore, technicians place the sensors in a homogeneous temperature block, e.g. an oil bath or calibration chamber. Following a saturation period, users can utilize reference values to automatically determine each channel's deviation.

Compensation values are then recorded in the compensation field of each sensor. This takes place as offset correction (1 step), slope adjustment (2 steps), or multipoint calibration (up to 100 steps). The actual test procedure then uses the sensor-compensated values so that post-processing of the measurement data is not necessary. This significantly cuts down on application development and post-processing time.

Delphin data loggers and multichannel data acquisition systems feature different analog and digital input and output modules for use with a wide range of signal types including voltage, 4-20 mA current, thermocouple, RTD, and resistance. These systems can process measurements and initiate actions on their own for local data acquisition and logging when connected to a PC, remote online data collection, or as stand-alone devices.

Every Delphin measurement system is delivered as DKD calibrated (German accreditation system) according to ISO 9001; also traceable to NIST. No matter your industry, Delphin and CAS DataLoggers will be happy to develop a custom data acquisition system for your specific measurement and testing requirements.

In-House Calibration

Calibration is necessary for sensors in many industries and applications to ensure certified measurements and to achieve regulatory compliance. At CAS DataLoggers we offer in-house temperature calibration service to customers in every industry including manufacturing, testing, and laboratory applications. We're one of relatively few data logger distributors to offer in-house calibration services. We also offer official Certificates of Calibration and NIST-Traceable Calibration as proof of regulatory compliance.

CAS DataLoggers is the North American Master Distributor for Delphin, and our full range of Delphin's measurement technology products and services can help you to get your application quickly started and smoothly implemented.

For more information on Delphin Data Acquisition Systems and Data Loggers, a multichannel data acquisitions system or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.