High-precision and multichannel temperature measurement

Delphin Technology offers a compact system, easy to install in control cabinets, for temperature measurement in process engineering. The device can be used to connect eight thermocouples or Pt100(0) sensors. Add-on modules enable the system to be extended by up to 3000 channels.

Temperature acquisition is a major requirement in industry and research. Virtually every application measures temperatures so thermocouples or RTDs (Pt100(0)) are often in use. Measurement transducers are generally deployed in process engineering with the converted temperatures then being linked to programmable logic controllers as mA- or mV-signals. When high precision and multichannel temperature acquisition is necessary, specialist measurement systems are generally required. These devices are available for use in laboratories as tabletop or 19” versions. Delphin Technology’s ProfiMessage offers a highly compact and scalable system which is ideal for installation in control cabinets. The mounting in a control cabinet takes place using rails. The compact construction measures 20x11x9 cm and can acquire data from up to 30 thermocouples. Any thermocouple type, e.g. K, J, B, E, S or T, can be connected directly and without using measurement transducers. By using an add-on ProfiMessage slave module, up to 500 channels per system is possible. Power input is via 24VDC. An ‘on board’ Profibus interface makes it simple to connect the ProfiMessage system to a PLC system. To enhance precision of thermocouple measurement to ±0.2K, passive thermocouple compensation is available, also for the control cabinet. Connection to a control centre can take place via Ethernet. An OPC server and additional interfaces are also available. The company is based in Germany’s Bergisch Gladbach and offers its in-house developed ProfiSignal software system for the secure and easy acquisition of process signals. ProfiSignal is also designed to process large numbers of channels and provide easy evaluation.

Practical example: 4-channel temperature measurement in steel production

Steel production requires recording of large numbers of temperatures. A diverse range of thermocouples are used to accomplish this. The temperatures are acquired using Delphin Message devices. Measurement data is stored independently within the Delphin devices and transmitted via a LAN for centralised data recording using ProfiSignal to a server. A total of 180 channels are recorded for each control cabinet. To achieve high precision, special housings with isothermal, cold junction compensation are used. Other possible applications include the acquisition of temperatures on motors, generators or turbines, temperature measurement in chemical and pharmaceutical processes, monitoring of room temperatures and climate data, high-precision measurement using calibrated Pt100(0) sensors, multi channel temperature measurement using thermocouples, temperature measurement on test stands complying to FDA Part11, and long-term temperature measurement for service-life testing.