



Securely recording measurement data – PC-based or stand-alone?

Continuous, secure measurement data acquisition is possible both with a PC-based system or a stand-alone independent system. Which system you choose depends not only on your application but also on your infrastructure and available budget.

Measurement data acquisition requires a high level of measurement data security. Experiments are often time-consuming, expensive and, in many cases, can only be repeated at immense effort. It is therefore essential that the measurement technology functions reliably and data is recorded securely to ensure continuous measurement data acquisition. Such criteria is fulfilled by both PC-based as well as stand-alone data loggers. However, there are limitations when using PC-based systems.

Delphin Technology AG specialises in secure measurement data acquisition and data loggers, and provides in-house developed systems for both PC-based and stand-alone systems. They are special by being easy to operate while also capable of performing monitoring functions as well as automation tasks. Configuration and measurement data analysis is fast and simple using the in-house developed software. The devices and the functions require no laborious programming and are instead directly configured. This, among other things, enables analog channels to be individually adapted to applications. For example, standardised current and voltage signals, thermocouples and resistance thermometers are common configurations that can be quickly set up. This provides the basis for fast and effective measuring.

Compact and inexpensive without CPU and memory

PC-supported systems, such as Expert Key devices, enable inexpensive entry into measurement data acquisition. The devices have neither powerful CPUs nor internal memory capabilities so communications via LAN or USB to a PC are necessary for operation and data storage. This is also the reason for them being compact and inexpensive. Delphin offer Expert Key versions with the appropriate software for configuration and signal evaluation. The DataService configurator is used not only for setting up devices but also for recording measurement data to servers. A sampling rate of 100 kHz, optionally via 14 or 28 analog inputs, has the advantage of reliably recording data without any loss of information even for highly dynamic measurement tasks. Sampling rates can be individually set for each channel so that one device can record sensors of differing dynamics. Only the measurement data that is actually required is therefore generated. For Expert Key operation, an industrial-grade PC is recommended, specially designed for long-term operation and suitable as a secure and reliable basis for measurement tasks. Measurement data acquisition as well as processing takes place at the PC. USB and LAN interfaces are available for PC connection.

Stand-alone measurement data acquisition systems

Stand-alone measurement data acquisition systems can operate independently following setup procedures from a PC. Integrated, powerful CPUs and dedicated data storage capabilities enable reliable data acquisition and processing directly within the device. At Delphin, such devices belong to the Expert Logger series (image 2). With a range of calculation channels, such as threshold and average channels, these devices are able to directly process measurement data internally. In addition to the data acquisition function there are also monitoring and control functions requiring no programming expertise. The Expert Logger 100 version is equipped with 16 analog inputs which can be individually configured according to measurement requirements. With a sampling rate of 1000 Hz,

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even high-speed measurements can be performed. Furthermore, 4 digital input/outputs are available. Four switchable digital input/outputs are also available for further digital signals.

The diverse range of interfaces of the Expert Logger devices means they can easily integrate into existing infrastructures . Their OPC-UA interfaces enable easy linking with machine control systems. PROFIBUS, Modbus RTU, 2 X USB and RS232 interfaces extend the scope of applications. Where no LAN network connection is available and the device's integrated LAN interface can be used, the devices can be delivered with WLAN or LTE modules.

Typical applications

The table shows typical areas of applications for PC-based and stand-alone measurement technology. PC-supported systems can be used when an on-site PC is available. This is generally the case in laboratory operations or in test bench trials. Expert Key devices are also available for highly dynamic measurements requiring high sampling rates such as when measuring dynamic pressures.

Stand-alone systems are required when on-site PCs are unavailable and continuous data acquisition is required. They are also the right choice for critical and safety-relevant measurement tasks. They provide reliable data acquisition especially for field trials and make on-site PCs superfluous. This is especially beneficial in long-term trials and experiments. Redundant measurement data recording is also possible when they are integrated into a network. The measurement data can be stored to an internal memory and simultaneously to a database on the network server.

Summary

PC-based systems represent an inexpensive entry system and are ideal when a PC is already available at the site, e.g. in test bench applications. For continuous, redundant storage such as field trials and measurement applications, a stand-alone system should be preferred. The independently operating Expert Logger offers stand-alone operation options. For both PC-supported and stand-alone systems, measurement tasks can be individually set up using intelligent software from Delphin.