



Triathlon in measurement engineering

Measurement data acquisition for a diversity of applications

Measurement technology needs to be secure, precise and non-reactive in industrial applications. Systems of data acquisition which have proven themselves here should, according to a measurement technology specialist, also be suitable for test stand and environmental measurement technology and so developed a device to meet the combined demands of these three disciplines.

Measurement technology from Delphin is ideal whenever multiple sensors and signals need to be acquired, monitored, saved and analysed. In addition to acquiring and processing measurement data, the devices can also be used for control and regulating tasks. This diversity of functions means that the new Expert Logger devices from Delphin Technology are suitable for a range of different applications. The development of the Expert Logger measurement data acquisition devices is based on 35 years of experience. Each device is equipped with a detailed package of software and drivers to enable users to quickly set up systems for data acquisition and monitoring without costly programming effort. Three Expert Logger models are currently available. Depending on the model, 16, 32 and up to 46 analogue inputs are provided in compact, 210 mm wide devices. All analogue inputs feature precision 24-bit resolution to enable high-speed sampling rates of up to 50 measurements per second and channel. The Expert Logger's analogue inputs are designed to be differential and galvanically isolated from each other and are individually configurable for mV, mA, Pt100(0), resistance, thermocouple or DMS sensors. Resistances of up to 100 kOhm can be directly measured as well as Pt100(0) using 4 or 3 wire technology. In addition to the analogue inputs, the devices also feature digital inputs/outputs, counter and frequency inputs as well as PWM outputs.

Extensive storage options

The Expert Loggers are equipped with an internal storage capability of up to 14 GB (approximately 420 million measurement values). Data can be recorded to a ring memory and/or in event-operation with pre-and post histories. Data can also be automatically saved per FTP upload to an external storage medium such as a NAS drive, network server or internet cloud. For applications without networks, and where permissions have been granted, data from the internal memory is easy to access and transferred to a USB stick or HD.

A full system including software

The Expert Logger enables users to quickly and effectively accomplish their measurement tasks. Included in delivery and at no extra charge is the intuitive ProfiSignal Go software. The DataService configuration program is used to set up measurement and control channels from a PC. In the event of a power failure, the configuration remains intact within the device so that the device can restart fully automatically and continue its measurement and control tasks. ProfiSignal Go portrays both current and historical measurement data in the latest trend diagrams. Zooming data from year to millisecond level at high resolution is possible irrespective of the volume of data involved. ProfiSignal's Office compatibility is especially advantageous allowing quick ASCII export of measurement data to Excel or the insertion of vector-based graphics into Word documents.



Discipline 1: Industrial applications

The robust Expert Loggers are well-equipped for current and future applications in industry and process engineering. On the one hand, the devices can function independently thanks to their interfaces and diverse protocols for communication and data exchange at field bus (including PLC) and at control technology level making them fully compatible with Industry 4.0 requirements. A compact construction and easy mounting on C-rails also make the devices easy to integrate into existing control cabinets. Detachable terminal connectors greatly simplify installation and wiring.

Secure measurement data acquisition is guaranteed through galvanically isolated and differential inputs and eliminates earth loops and potential equalisation currents at the measurement signals. An integrated network interface permits data transmission via existing network structures. Even though the devices are easy to connect to networks, which enables online signal acquisition of visualisation, processing and monitoring functions can also be performed independently within the device. When a threshold value is violated, the device independently issues a message as an email or text message or directly activates an output switches on-site. Typical applications for Expert Loggers in industrial environments include condition monitoring, energy data acquisition and management according to EN 50001, fault analysis on machines and equipment, monitoring of process parameters, installation measurements and repeat testing, e.g. on safety valves.

Discipline 2: Environmental measurement engineering

A further core area of applications for Expert Loggers is in environmental measurement engineering, e.g. independent operation in weather stations, measurements at coastal protected areas, landfill facilities, building and bridge monitoring. Environmental sensors can be directly connected to the Expert Logger via serial interfaces such as RS232, RS485, with ModBus RTU, SDI12 and ASCII protocols. The devices are equipped with an energy-saving sleep-mode with freely definable wake-up and measuring intervals to make them ideal for independent operation. They can function with rechargeable/standard batteries and solar panels.

An integrated LTE/UMTS module enables measurement data to be transferred fully automatically to a server or a cloud via a push function. Configurations can be modified at any time via remote maintenance. A touch display gives access on-site to the current measurement data without the need for a PC or laptop

Discipline 3: Laboratories and test engineering

In laboratories and test engineering, Expert Loggers are used for acquisition and for control and regulating tasks. The loggers are equipped with an extensive library of functions in the form of software channels for fully automating test stands. The devices use sequencer channels to determine setpoint profiles, to automate testing procedures, and to perform time/event-based controlling. Integrated PID controllers, logic channels, flip-flop channels and calculation channels enable easy configuring and implementing of tasks. PWM outputs allow the direct control of fans, motors and actuators. The device is able to function independently means and is therefore being used in service-life testing, environmental simulation and automotive test stands. The Expert Logger 300 device is ideal for use in multichannel applications such as temperature distribution measuring on lamps, household appliances and heating systems. Measurement engineering tasks such as quality assurance, data acquisition in chemical and pharmaceutical laboratories, material trials, experiments on rechargeable batteries and hydrogen cells, are typical areas of application for the new Expert Logger devices.



Summary

In combination with the ProfiSignal software, Expert Logger devices demonstrate that universal measurement data acquisition devices can also be simple to set up and operate. The loggers are maintenance free due to the absence of electromechanical components such as relays. Users are able to begin instantly with their measurement tasks by using the software package included with the hardware.