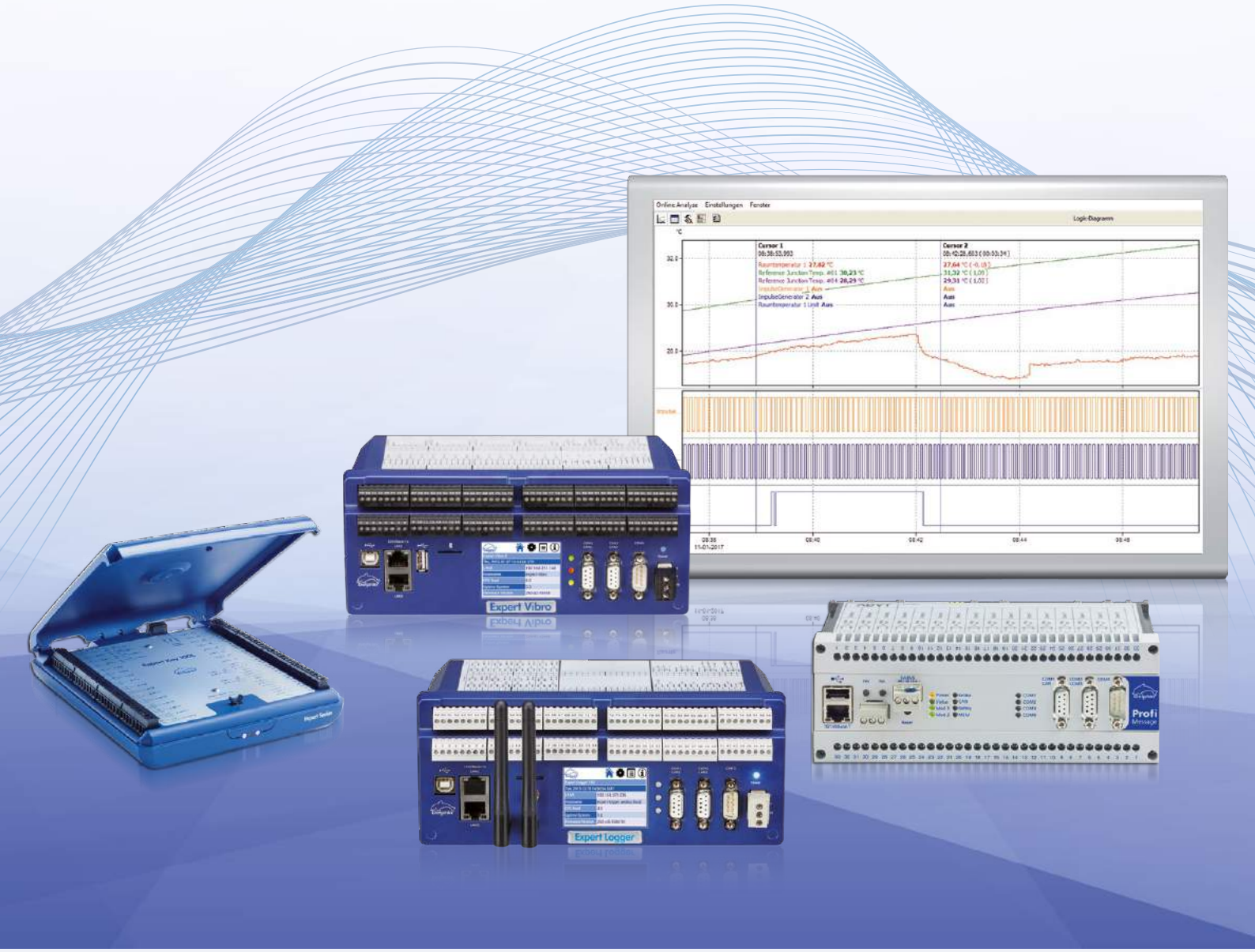
# Product catalogue






2018/2019

**Measuring. Testing. Automation.**

Delphin Technology

## Intelligent Measurement Technology

We at Delphin supply our global customers with intelligent, universal data acquisition hardware and intuitive measurement software. This enables our customers to reliably and efficiently carry out their measurement and monitoring requirements.

# Contents

# Delphin Technology AG

## Your competent partner for standard measurement systems and custom-made complete solutions

Since 1980, Delphin Technology AG has been developing pioneering, high-quality measurement equipment and software solutions for industrial measurement and testing technology.

We are a competent and dependable partner to customers around the world – for both standard measurement systems as well as for custom-made complete solutions. Our team of technical specialists take great pleasure in their work and transform creative ideas into practical products.

Delphin products focus on application requirements ranging from measurement data acquisition and analysis through to test stand automation, monitoring and vibration measurement technology. The products are being used in a range of branches including electrical engineering, mechanical engineering, energy technology as well as in the chemicals and pharmaceuticals industries.

## Continuity – Focusing on customers

We focus on our customers who benefit from our technical expertise as well as the more than 37 years of tried and tested experience we have gained in the field of industrial measurement technology. It is important to us to work closely with customers to determine their precise needs and requirements. This approach is reflected in our product range as well as in the long term customer relationships we have established.

A multitude of medium-sized companies, world renowned industrial groups as well as research laboratories, authorities and universities place their trust in us and benefit from our many years of experience. We provide them with services ranging from pre-engineering through to training, whether for standard measurement systems or custom-made complete solutions.

## Quality – Made in Germany

The continuous development of our products and maintaining the highest standards of quality are primary aims at Delphin. Delphin Technology AG is certified according to ISO 9001:2008. This guarantees that our products meet the most stringent of quality assurance requirements and will provide reliable service for your applications. Delphin gives you the "Made in Germany" guarantee.


## Innovation – Intelligent measurement technology

Our aim is to supply our global customers with intelligent and universal data acquisition equipment and user-friendly measurement software. We achieve this through ongoing technological progress. Our customers need to be able to carry out their measurement and monitoring tasks efficiently and securely. Based on our many years of experience, we have extensive knowledge about products and applications and work permanently on technological innovations and new features for our products. Our innovations have been patented worldwide.

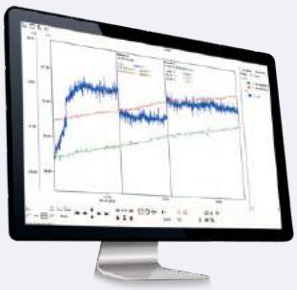
## Flexibility – Your custom-made complete solution

Flexibility and simple structures are further building blocks within our company philosophy. This means we meet the needs of the customer. We provide standard solutions as well as custom-made complete systems. We make mobile measurement cases, switch cabinets and complete test stands according to your specific needs and program them to your own personal requirements using ProfiSignal software.

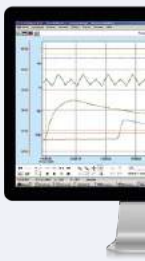
## Customer services

Customer service has top priority at Delphin. Our services include project planning, system installation, calibration, hotline services, courses, and project-based, tailor-made training sessions. System installation and training is carried out by a competent team of experienced engineers either at Delphin or at the customer's premises. Our package of services guarantees you first rate support from the outset.

# Delphin Technology – Product overview

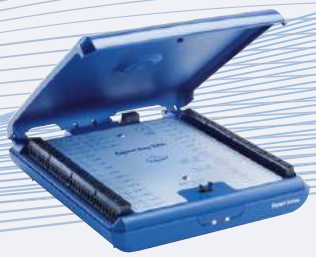


**ProfiSignal Go**
Data acquisition and analysis

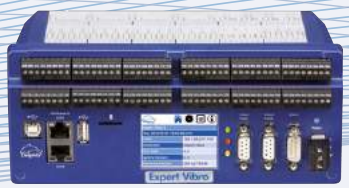


**ProfiSig**
Operating a

**Expert Logger**
Stand alone data logger



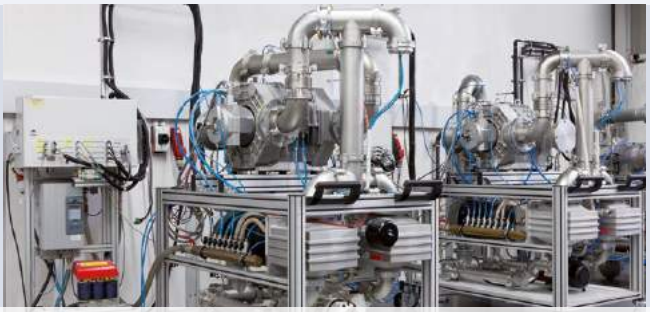
**Expert Key**
PC-based measurement technology



**Expert Vibro**
Vibration measurement

**Expert Transient**
Transient data acquisition

**Data acquisition and data logger**



**Test, trial and automation**

nal Basic
nd monitoring

ProfiSignal Klicks
Automation

ProfiMessage
Modular measurement
technology and automation

LogMessage
Highest galvanic
isolation

Compact measurement
system

**Monitoring and environmental technology**

**Vibration measurement**

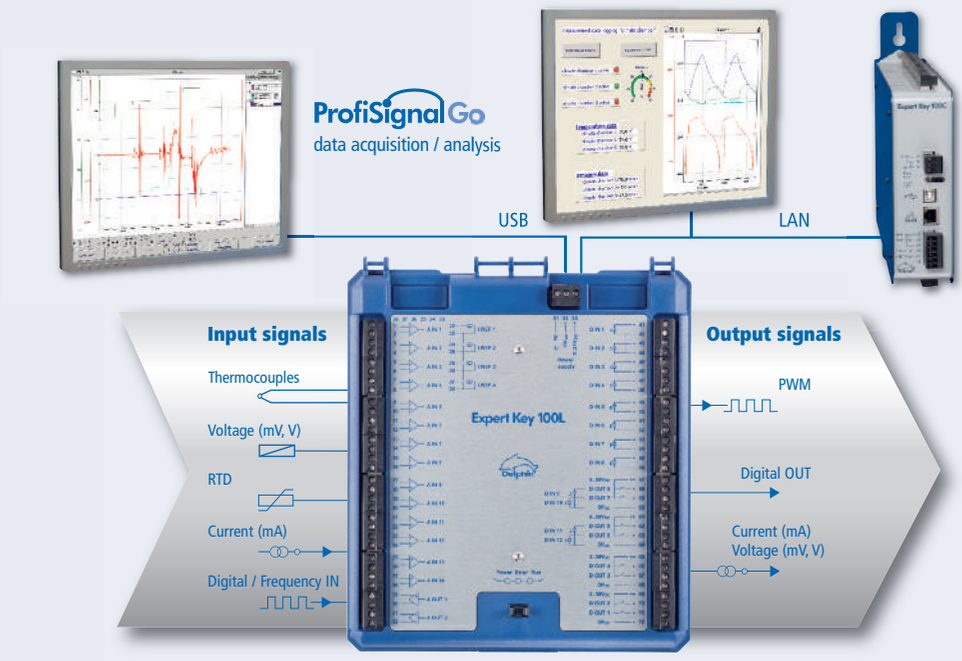
# Expert Key – PC-supported measurement

## Measurement data acquisition mobile and stationary

Expert Key devices acquire and monitor measurement data and automate experiment and test stand installations.

Expert Key is available in four models: for laboratory (L), industry (C), testing (P) and temperature mesurement (T). Expert Key is therefore a universal and quick to deploy data acquisition system for permanent or mobile systems.

Expert Key is a compact device with a wide range of analog and digital inputs / outputs and plug-in terminals. Expert Key has two alternativ interfaces: USB and LAN. These enable measurement data to be acquired locally at a PC or, for example, transmitted from a test stand via a company LAN. Expert Key enables fast system set-up and mobile measurement with a laptop and the ProfiSignal Go software. Expert Key is also suitable for permanent installations using cabinet systems.




## Product features

- Very cost effective
- Communicates via USB or LAN
- Universal inputs and outputs
- Scalable, even for large applications
- Synchronizing of multiple devices
- Ease of operation
- Drivers for LabVIEW™, Modbus, OPC, DASYLab™ available
- "Made in Germany" quality

# technology

## Flexible

Expert Key devices are available with a range of channel numbers. Type 100 is equipped with analog and digital inputs and outputs and is therefore highly suited for use within test engineering.

Type 200 has 28 universal inputs and is highly suited for analog data acquisition.

**Technical specifications are available on page 48.**

**Expert Key**

| Type | 100 | 200 |
|---|---|---|
| Analog inputs (mV, mA, TE, RTD) | 14 | 28 |
| Analog outputs (mA, mV) | 2 | 2 |
| Digital inputs (frequency, counter)*[1] | 12 | 1 |
| Digital outputs*[2] | 8 | 1 |

*[1] 4 switchable as digital outputs
*[2] 4 with PWM function

Expert Key models

## Universal connectivity

Differential inputs are used exclusively as input signals. These can be configured individually as mA, mV or V signals and as RTDs or thermocouples. Any sensor can be attached to the terminals which are able to accommodate lines of up to 2,5 $mm^2$ in diameter. Integrated signal conditioning enables mA, V measurement data to be converted into the required unit of measurement, e.g., bar, N, %rh etc. In contrast to many low-cost products, Expert Key devices are equipped with full potential isolation.

Analog input sampling rates achieve 100,000 measurement values per second. Analog output signals can be output to mV or mA switchable outputs.

Digital inputs (with counter functions of up to 1 MHz) and digital outputs (with PWM function) with switch capacities of up to 30 W are standard in the 100 version.

## Easy configuration and connection

Channels are easy to configure using the powerful ProfiSignal configurator included in the Expert Key delivery. Following drivers to enable integration into the user's existing software systems are available: LabVIEW™, DASYLab™, Diadem™, OPC-Server, Modbus TCP driver for deployment in industrial environments, as well as the OCX driver and .NET programming interfaces.

# Expert Key – Models

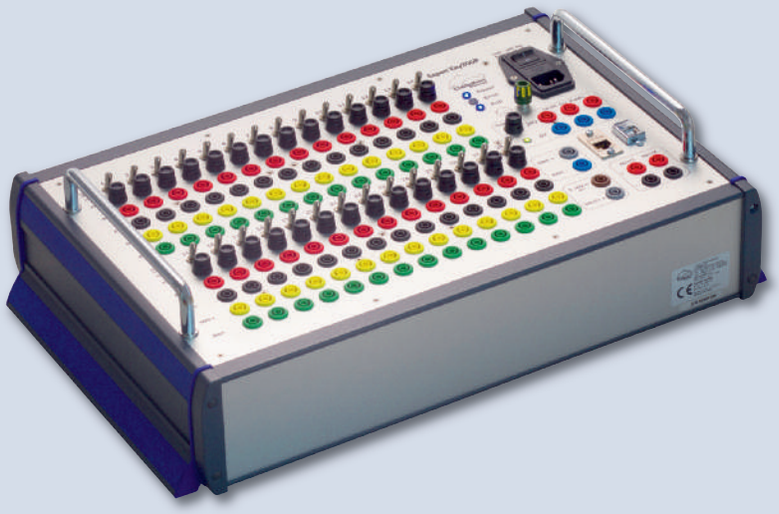
## Expert Key L – for laboratories and service

The Expert Key 100L and 200L have a tabletop design. A pop-up lid gives a clear overview of connections. Sensors and actuators are connected via plugs located on the sides. Because of the L model's universal capabilities, it is particularly suited to laboratory, experiment, test and service applications. Supply adapter is included in the delivery.


**Expert Key 100L**
**Expert Key 200L**

## Expert Key P – for experiments and testing

The Expert Key 100P and 200P have a console-type design. These models are intended for use in testing and laboratory environments. Signals are connected via 4 mm safety lab plugs. Measurement data from sensors can be transmitted to a PC via USB or LAN interfaces. RTD sensors, voltage and current signals are directly connected to any of the analog inputs. ProfiSignal software enables users to generate systems for data acquisition that comply to FDA 21 CFR Part 11.



**Expert Key 100P**
**Expert Key 200P**

## Expert Key C – for cabinet installation

The Expert Key 100C and 200C are identical to the L models apart from the housings. The housing design enables the devices to be used in cabinets or 19" rack systems.

Expert Key can also be supplied without an housing to enable OEM systems.


**Expert Key 100C**
**Expert Key 200C**

## Expert Key T – multi-channel temperature measurement

The devices, designed for multi-channel temperature measurement but also suited to temperature measurement and combined high-speed signal acquisition.

The compact Expert Key T devices have console-type housings. They are intended for use in laboratories and test stands as tabletop or wall-mounted devices. The analog and digital inputs and outputs are easy to access and signals and actuators are quick to connect requiring no tools.

**Expert Key 100T**
**Expert Key 200T**

# Expert Logger – Stand alone data logg

## Universal, communicative, reliable

Expert Logger is Delphin's new generation of data loggers. It combines the latest communication technology with advanced measurement technology, and is based on FPGA technology to make it especially powerful. It can process up to 46 analog input channels at both low and high rates of sampling. Measurement data can be accurately acquired, independently stored and transmitted into the cloud or a PC for evaluation via USB, LAN, WLAN or LTE.

Expert Logger is available in four versions which differ only in the number of analog and digital inputs they can process. All Expert Logger devices are equipped with internal 2 GB memories that can independently store up to 60 million measurement values with date and time stamps to msec precision. Storage capacity can be extended as required via external USB or LAN storage devices (NAS). An integrated, energy-saving "sleep function" automatically switches off the device during breaks in measurement acquisition. The Expert Logger operates with standard batteries, rechargeable batteries or solar units.

Precision measurement is ensured through the use of a 24-bit converter. Voltages can also be precision recorded to the µV range. All channels are galvanically isolated to suppress earthing loops and the tried and tested input circuitry protects the device against voltage spikes. Electromechanical components are avoided (relays multiplexer), and the device operates noise and maintenance free. Delphin's patented analog inputs guarantee years of reliable measuring work.

## Sensor connection

- Universal analog inputs (mV, mA, TC, RTD)
- Digital inputs and outputs
- Plug-in screw terminals

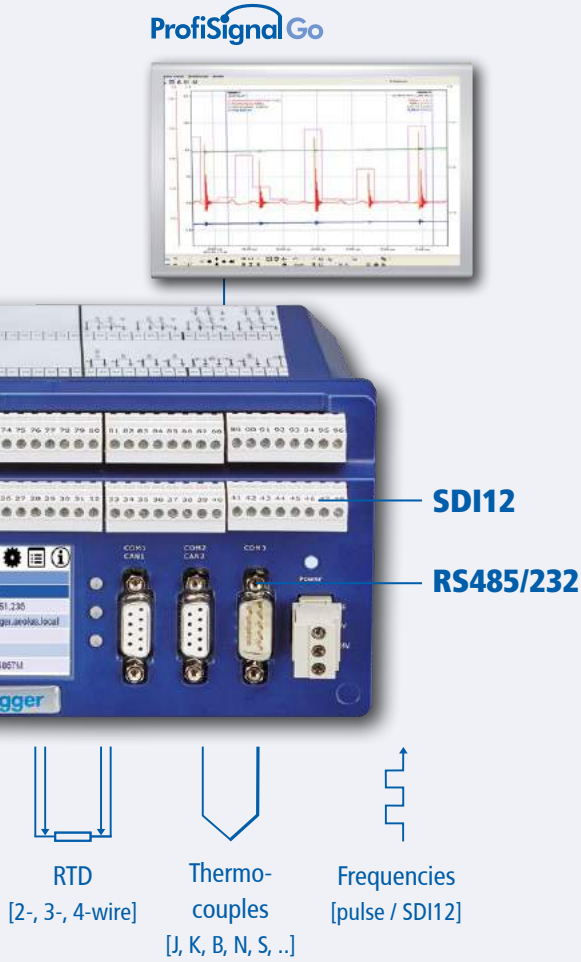

## Internal data storage

- 2 GB of internal data storage for up to 60 million measurement values
- Expandable to 4 GB up to 420 million measurement values
- Time stamps to msec resolution
- Data read out via LAN, WLAN, LTE or USB interface
- Event-triggered recording with pre and post histories

# er. Latest communication technologies.

## External data storage

- Data recorded to external storage media (USB, NAS)
- PUSH function to send measurement data to the internet




## PC and field bus interfaces

- LAN, WLAN and USB interface to a PC or network
- CAN-Bus interface for reading / writing identifiers
- Field bus interfaces PROFIBUS DP, Modbus

## Remote monitoring

- WLAN link to PCs and mobile devices
- Optional LTE / UMTS / 4G integrated modem
- Automatic notification via email or text messaging

## Monitoring functions

- Monitoring and data logging in a single device
- Limit value setting for any sensor signal or calculation channel
- Controlling digital outputs with user-defined triggering

## Signal processing

- Averaging (middle, min, max, RMS values)
- Integration of time signals into volumes, masses or working values
- Computational functions (basic functions, polynomial, trigonometric ...)

## Serial and SDI12 interfaces

- SDI12 interfaces for environmental sensors
- Serial RS232 ports and a RS485
- Configuration of individual ASCII protocols

## Battery and rechargeable operation

- Independent operation possible with batteries or rechargeables
- Minimal energy consumption via a sleep function
- User-defined wake and measuring intervals

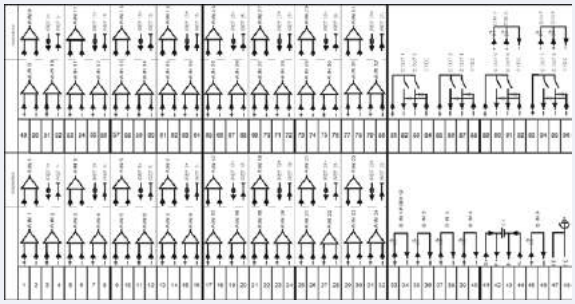
# Expert Logger – Simple to operate

## Configuration made simple

The Expert Logger is simple to configure from a PC. These settings remain stored within the Expert Logger even when disconnected from the power supply. The device settings can also be read out and stored on a PC and analysed offline without the need for a connected Expert Logger. The offline configuration settings are then simply read into the device when connected. The software used for configuration is simple to operate to let users fully focus on their measurement tasks.

## Operation made simple

Sensors are connected via plug-in screw terminals and a chart clearly shows how channels are arranged. Users always have a good overview of the channels despite their high density. Each set of four terminals can be configured as two differential inputs to measure voltage, currents, thermocouples, or to take measurements from a 4-wire RTD.



## Intelligent signal processing

Signal processing using internal software channels significantly simplifies measurement tasks. Flexible calculation channels enable measurement data to undergo further computation and recording. Integrators directly calculate volumes or quantities from time related measurement data such as mass and discharge flow rates. Limit values can monitor measurement data and be used to switch digital outputs or automatically send emails. Complex signal processing is possible using pulse counters, stop-clock functions and operating-hours counter. Averages can be calculated and recorded as time-weighted or moving. The Expert Logger's software channels clearly set it apart from other loggers and make it very popular among users.

| Online analysis | Description |
|---|---|
| Calculation channel | Any number of channels can undergo computation procedures. Functions include: basic arithmetic functions; trigonometry; binary and boolean operations |
| Channel averaging | Computation of moving and triggered averages |
| Edge counter | Counter for impulses (high, low, and reset functions) |
| Integrator | Numerical integration over time |
| Linearization | Corrective calculations on non-linear sensors |
| Operating hours counter | Accumulates the time (in hours) of a digital signal's high-level |
| Statistic channel | Computes moving and triggered statistical values (min, max, variant, standard deviation) |
| Stopwatch | Time measurement between two events |
| **Monitoring** | **Description** |
| Limit value | Generates events for threshold violations (over- / under-runs, inertia, hysteresis, process monitoring) |
| Batch alarms | Generates a single alarm from multiple input channels |
| Wake function | Generates pulses at a chronological point in time (once a day, week, month …) |
| Status monitoring | Evaluates status information for measurement data and generates an alarm |

## Expert Logger

| Type | 100 | 200 | 300 | 400 |
|---|---|---|---|---|
| Analog inputs for mV, mA, thermocouples | 16 | 32 | 46 | 16 |
| Appropriate for RTD´s | 8 | 16 | 23 | 8 |
| Sampling rates (measurements / sec.) | 1000 | 2000 | 3000 | 1000 |
| Analog outputs | 0 | 0 | 0 | 6 |
| Digital inputs (mV, frequencies) | 4 | 4 | 0 | 1 |
| SDI12 sensor bus | 1 | 1 | 0 | 0 |
| Digital outputs | 4 | 4 | 0 | 0 |
| Digital inputs / outputs | 4 | 4 | 1 | 24 |

Expert Logger is available in four versions which differ only in the number of analog and digital inputs they can process. Select the suitable type from the table.

**Technical specifications are available on page 49.**


## Expert Logger accessories

- Rechargeable pack for energy independent operation
- External data storage
- UMTS / LTE module
- WLAN module

## Touch display

The touch display enables users to configure the Expert Logger's basic settings such as the IP address and network mask. The display also simultaneously shows selected measurement data. The display operates via either touch or an external USB mouse.

# Expert Vibro – Vibration measurement

## Vibration measurement with state of the art processor technology

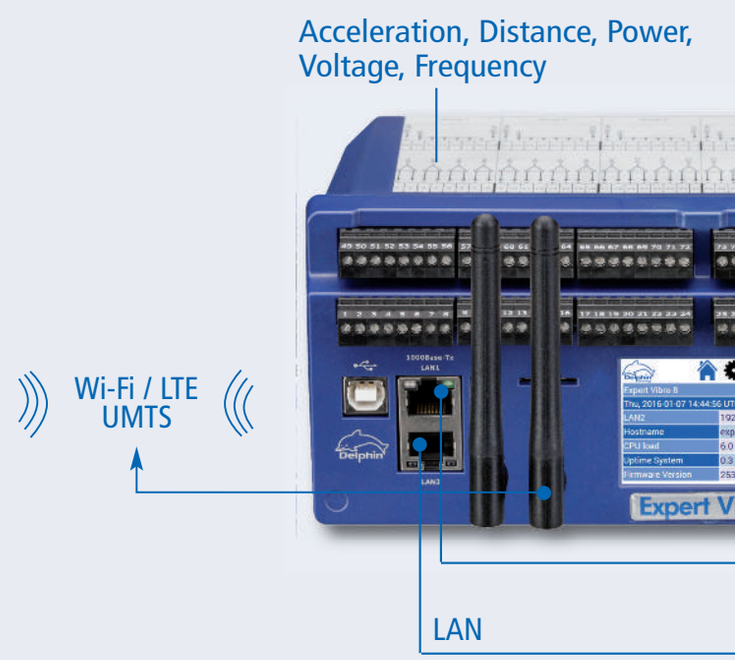
Expert Vibro is Delphin Technology's device for acquiring transient signals and vibrations. The latest processor technology enables 16 synchronous channels to be processed sampling rates up to 50 kHz per channel while requiring minimal space. 24-Bit A/D converters ensure high precision. Users may switch between voltage measurement, IEPE or shaft vibration sensors. Integrated comparators and digital inputs allow flexible triggering. Measurement data is monitored "on the fly" with digital outputs being switched within msecs in the event of a limit value violation.

## User friendly configuration

Vibration measurement with Expert Vibro is user friendly. Intuitive configuration means fast installation and short training times. All relevant characteristic values are obtained from spectra and time signals. Spectra are calculated online and saved independently with time signals and characteristic values. Versatile software channels enable the Expert Vibro to perform complex analysis and monitoring tasks. The Expert Vibro's touch screen can display configuration or measurement data.

## Universal sensor connection

- Analog inputs switchable via software
  - Eddy current sensors
  - Acceleration sensors
  - Velocity sensors
  - mV / mA signals (pressure, etc.)
- Selectable IEPE feeds
- Integrated comparators for Keyphasor® sensors
- Measuring range to ± 25V
- Plug-in screw terminals




## Fully equipped – compact design

- 8 / 16 vibration inputs capable of being individually triggered
- 50 kHz sampling rate per channel (Σ 800 KHz)
- Up to 14 GB data logger memory
- 4 digital inputs for frequency measurement of up to 1 MHz
- 8 digital outputs
- 4 analog outputs for monitoring purposes
- Convenient DIN rail-mounting
- Display capable of on-site graphic portrayal

## Applications

- Shaft vibration monitoring and analysis
- Bearing damage diagnostics
- Combustion chamber vibration monitoring
- Gear box analysis
- Housing vibrations
- Mobile vibration measurement

## A range of interfaces

Expert Vibro can be connected via LAN to the intranet/internet and via USB to PCs. For standalone applications, integrated Wi-Fi, UMTS or LTE modules are optionally available. Connection is via an antenna at the SMA connectors. In addition to two PROFIBUS interfaces, Modbus TCP is available to users for fieldbus connections. Multiple Expert Vibro devices can be synchronized with each other.

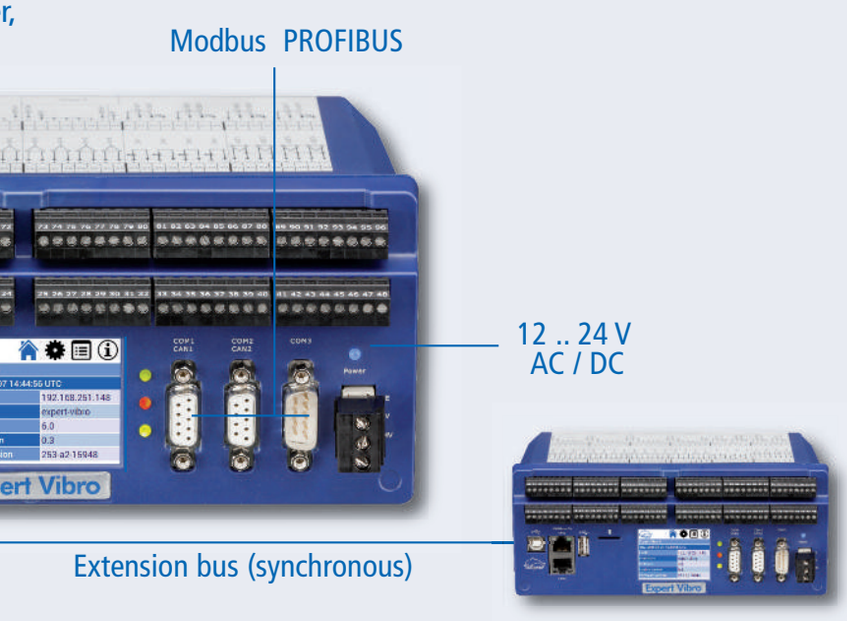
**Expert Vibro**

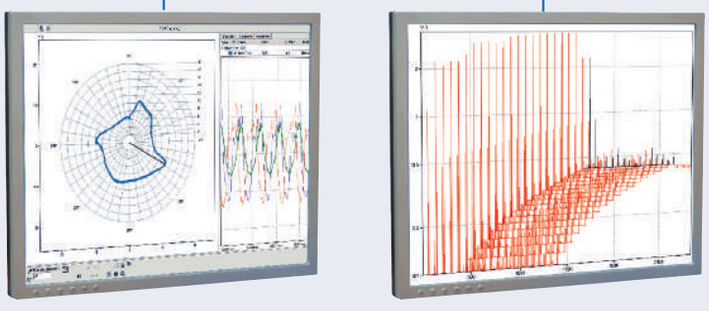
| Inputs / outputs | Type 8 | Type 16 |
|---|---|---|
| Analog inputs (mV, mA) | 8 | 16 |
| Analog outputs (mV, mA) | 4 | 4 |
| Digital / frequency inputs | 4 | 4 |
| Digital outputs | 8 | 8 |

Expert Vibro inputs / outputs

**Technical specifications are available on page 50.**

r,



Orbit, Time signal

Cascade, Spectra

ProfiSignal

## Local and decentralized interfaces

- Interfaces to PC
  - LAN interface (Modbus TCP)
  - USB host for data read out
- Field bus interfaces
  - 2 x PROFIBUS DPV1 slave (redundant)
  - 3 x serial interface (Modbus RTU)
  - 2 x CAN interfaces
  - Optional OPC UA
- Remote monitoring
  - Optional Wi-Fi
  - GSM / UMTS / LTE optional

## Monitoring and online analysis in a single device

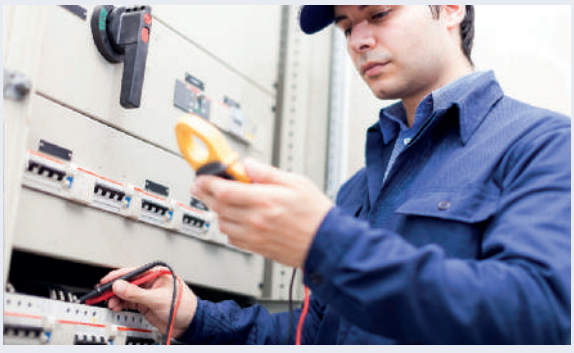
- Fast limit value monitoring of time signals
- Monitoring of characteristic values
- Online transfer of measurement data
- Spectrum – online – up to 12,800 lines (FFT)
- Versatile characteristics (characteristic values for phase, frequency and amplitude)
- Accounting and statistics function
- Integration functions (two-stage)

# Expert Transient – Data recorder, fault

## Synchronous and fast

Expert Transient is an independently operating data recorder for the synchronous acquisition of transient processes. Measurement data recording can take place continuously over long periods or via triggering. With the optional ProfiSignal Go software enables recorded signals to be portrayed live in y(t) diagrams. Even high volumes of historical data are easy to analyse using ProfiSignal. The Expert Transient uses the powerful FPGA technology and features the following:

- Data acquisition from transient and periodic signals
- Triggered and continuous acquisition modes
- Diverse range of analysis functions
- Optional with the ProfiSignal Go analysis software
- Synchronously extendible with analog and digital inputs
- Independent, stand alone operation with long-term data storage capability
- Connectivity via WLAN or UMTS / LTE networks
- Highly compact design at a competitive price



## Applications

- High-speed acquisition of analog or digital signals
- Fault diagnostics on machines, systems and test stand
- Evaluation of pressure pulses / surges
- High-speed process monitoring and controller optimisation
- Crash, detonation and explosion experiments
- Shock and vibration measurement
- Material research and environmental simulation
- Test stands and lab experiments

**Expert Transient**

| Inputs / outputs | Type 8 | Type 16 |
|---|---|---|
| Analog inputs (mV, mA) | 8 | 16 |
| Analog outputs (mV, mA) | 4 | 4 |
| Digital / frequency inputs | 4 | 4 |
| Digital outputs | 8 | 8 |

Expert Transient inputs / outputs

## Input signal

- Acquisition and analysis of high-speed, transient signals
- Triggered or continuous recording modes
- Synchronous acquisition of 8 or 16 galvanically isolated analog signals
- Sampling rates of up to 50 kHz per channel
- High measurement precision (24-bit ADC)
- Four synchronous digital inputs

## Trigger and monitoring functions

- Multiple, flexible and user-defined trigger events
- Partitionable, triggered data storage
- High-speed digital outputs for limit value violations
- Alarms via email or text messaging
- Suitable for the acquisition of periodic signals (option to calculate FFT and characteristic values)

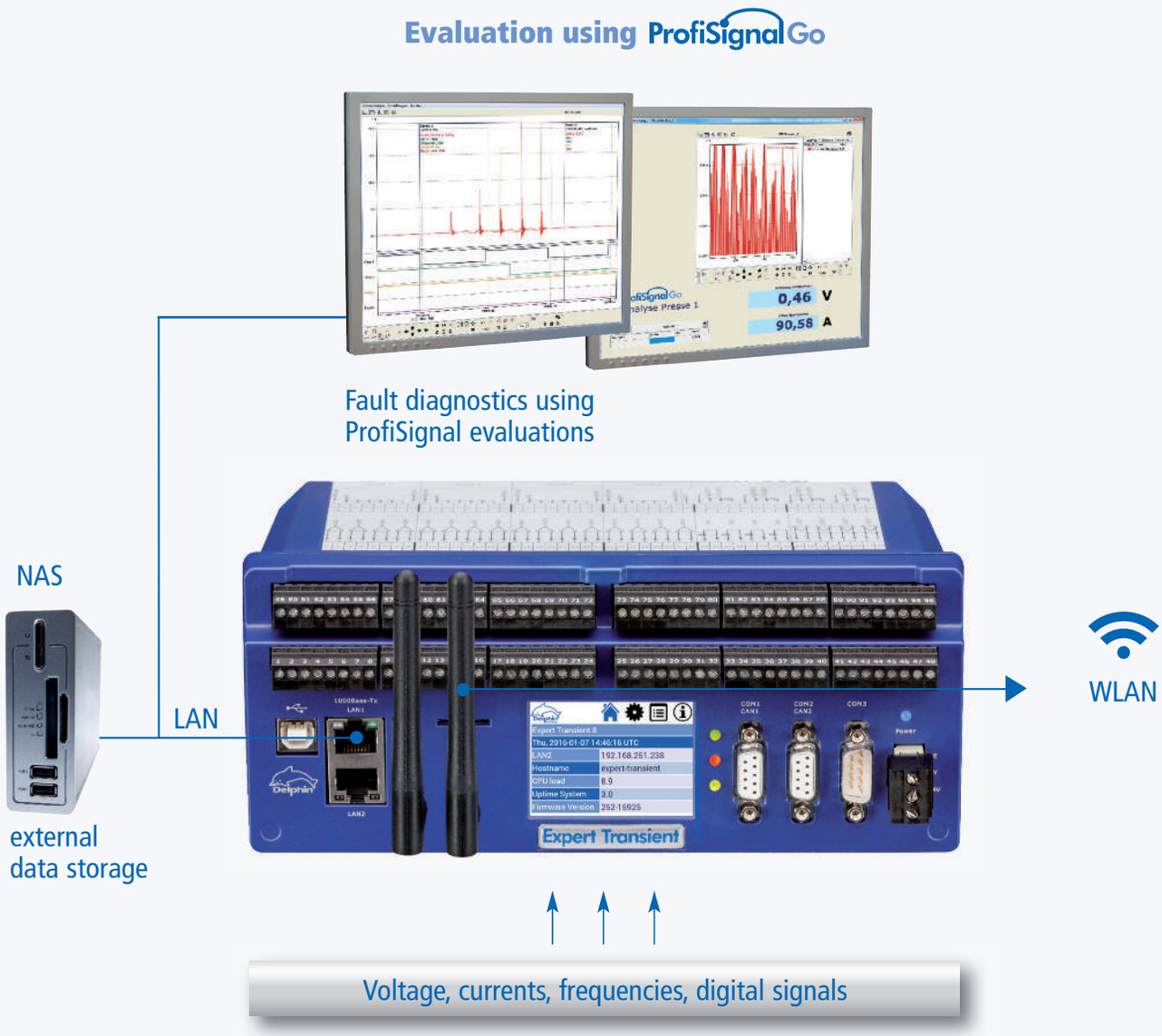
## Signal conditioning

- Online computation of effective and peak values

## Accessories

- NAS storage device with connectivity via LAN
- Mobile measurement case with BNC connectors
- WLAN, UMTS or LTE interfacing

# diagnostics, transient data acquisition




## Interfaces and design

- Measurement and device configuration via LAN / WLAN
- Remote connectivity via WLAN, UMTS or LTE
- Highly compact design

## Extendible

- Over 100 synchronous analog channels
- Parallel acquisition of up to 100 digital channels
- Slow process measurement data

## Data recording

- Independent, internal 2 GB data storage capability (up to 16 GB extendable)
- Long-term data recording to NAS
- Absolute time synchronisation via GPS or NTP
- Automated FTP upload into the cloud
- Internal time synchronisation via PTP

**Technical specifications are available on page 51.**

# LogMessage 5000 – Highest galvanic is

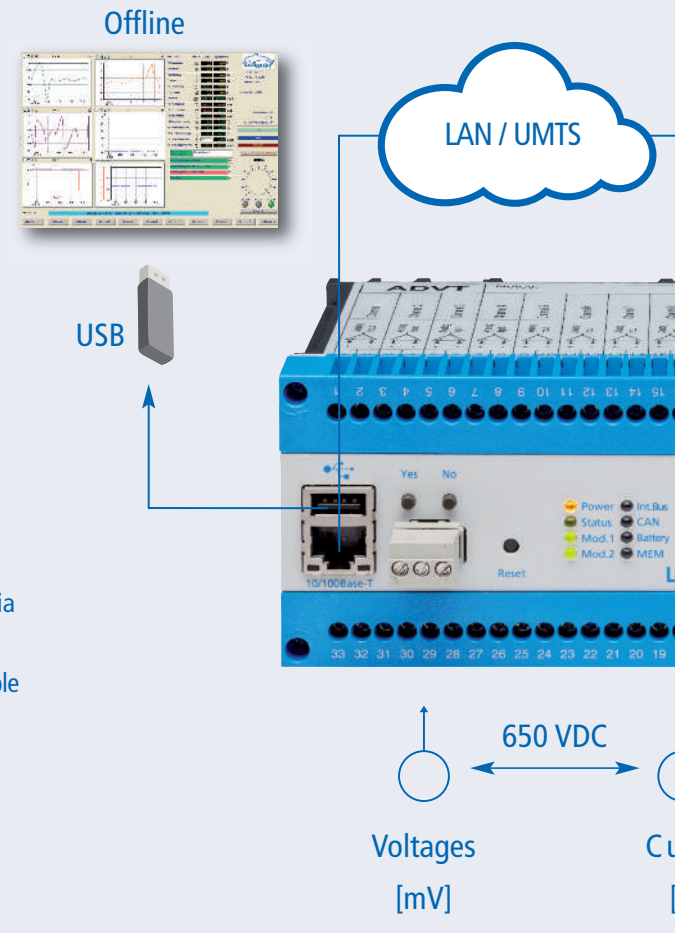
## Extensive functions

LogMessage 5000 data loggers are universal. The LogMessage 5000 is equipped with 16 universal analog inputs. The inputs are designed to cope with high voltages between the individual channels. The LogMessage 5000 is therefore capable of the problem-free measurement of non-isolated signals.

LogMessage 5000 devices function intuitively making it easy to configure inputs, to save data, and to display data as trends. LogMessage devices are designed for permanent operation and can be depended on to perform reliably over the long term. When data security and reliability are top priorities, users choose the "Made in Germany" logger.

## A range of interfaces

- LAN interface
  - Device configuration and online data transfer to PC
  - Link to UMTS-routers
  - Log memory read-out
  - Modbus TCP for data transfer using PLC
- USB interface
  - Log memory read out
- Serial interfaces
  - Customer-specific protocols (ASCII)




## Universal sensor connection

LogMessage 5000 devices are precision instruments that can be switched via software to function with any type of sensor.

- Universal use of analog inputs for mA-, mV-signals, RTDs, or any thermocouple
- Signal rate of 0.1 Hz to 60 Hz

## Galvanic isolation included

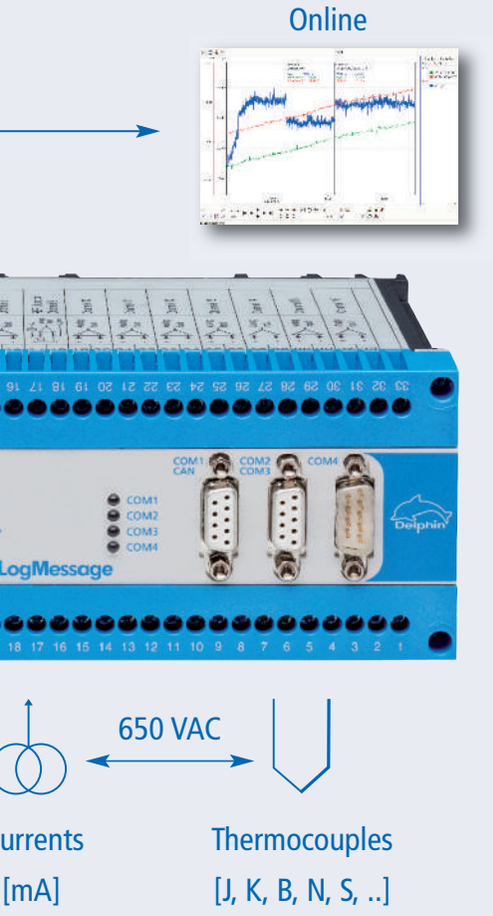
LogMessage 5000 devices are fully protected against earth loops enabling measurements from non-isolated sources.

- All analog inputs can function as differential inputs
- Isolation voltage between analog inputs: up to maximum of 650 VDC
- Galvanic isolation between power supply and each interface
- No earth loop problems

# olation

## Applications

- Potentially affected measurements
- Secure data acquisition with stand alone capability
- Acquisition via universal sensor signals
- PC-independent measurement and testing
- Product testing, laboratory, R&D
- GPS data logging and remote monitoring
- Temperature data acquisition
- Mobile data acquisition




## Secure data storage

The LogMessage 5000 data storage capability enables it to function without PC or network support.

- 2 GB of memory for 60 million data records
- Each measurement data record is recorded with a time-stamp (date and time – at microsecond precision)
- Measurement data can be assigned to groups and used as triggers
- No data loss in the event of power failure
- Alarm management with pre and post alarm data

## Comprehensive signal processing

Software channels, configurable according to requirements, can be used for online calculation, monitoring, and many other functions. This enables data to be generated that is immediately usable.

- Online calculations performed on measurement data (e.g. temperature differentials)
- Integration functions (e.g. flows to volumes)
- Limit value monitoring with alarm functions (switching digital outputs)
- Counter function and operational data acquisition

## Resolutions for demanding requirements

LogMessage 5000 is suitable for versatile measurements. All analog inputs are capable of measuring mV and mA signals, any type of thermocouples as well as RTDs. The device is equipped for precision measurement with 24-Bit ADCs.

**Technical specifications are available on page 52.**

# ProfiMessage – Modular data acquisitio

## Modular and secure

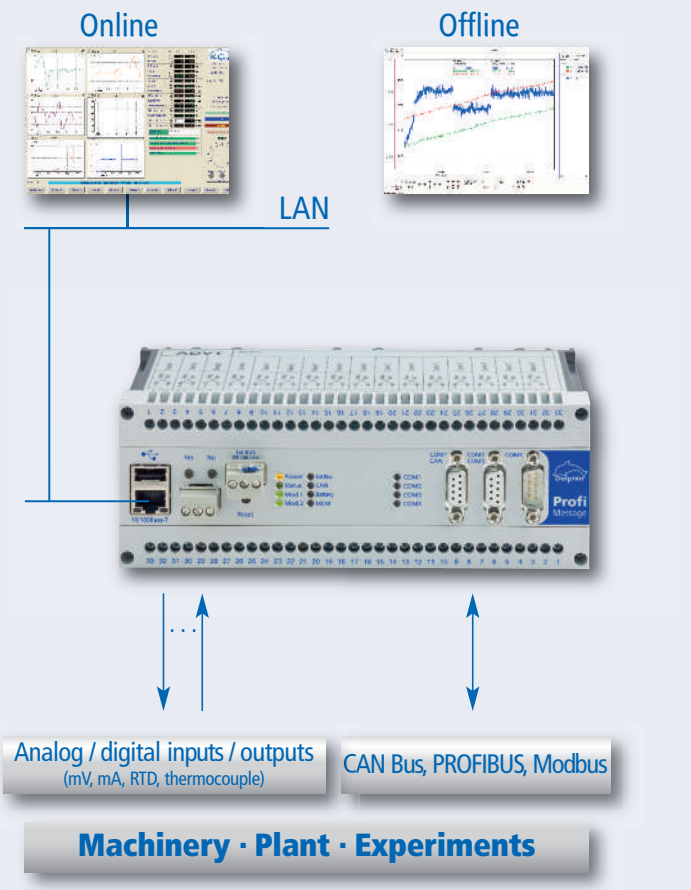
ProfiMessage is the modular system for data acquisition, monitoring and automation of machinery, plant and test stands. ProfiMessage uses master and slave devices and a range of I/O modules to enable it to be adapted to any application.

ProfiMessage is for applications requiring high-speed, precision data acquisition with galvanic isolation, intelligent data preprocessing and monitoring functions. Areas of application range from the monitoring of industrial processes, plant and clean rooms through to data acquisition and test stand automation.

ProfiMessage devices have universal connectivity. The devices are equipped with flexible I/O modules and a range of field bus interfaces. Connecting to PLC control systems for data exchange is easy and problem-free. Measurement data is stored with extremely high time resolution making it particularly suited to systems for fault data acquisition and diagnostics.

The compact devices measure and store data as stand-alone, independent systems. An internal 14 GB memory is able to record.

The data can also be accessed online via an Ethernet interface, either manually or automatically according to predefined time plans. At the press of a button on the USB port, the data can be transmitted to a USB memory stick and evaluated offline.




## Applications

- Modular data acquisition and monitoring
- Process data acquisition and data preprocessing
- Fault data acquisition and damage diagnostics
- Acquisition, processing and recording of PLC and field bus signals
- Monitoring device for process and vibration signals
- Automation device for experiments and test stands
- Intelligent data logger with high capacity memory
- Remote monitoring device for plant and machinery
- Laboratory data acquisition and automation

**Technical specifications are available on page 53.**

# n and automation

## Intelligent monitoring and analysis

ProfiMessage devices are equipped with further functions in the form of software channels. Software channels enable functions such as threshold value monitoring, mathematical integration or online computations. They are extremely easy to configure. Users are then able to program their own monitoring or online analysis systems into the device without requiring any IT expertise. Delphin products stand out with this functionality. Users are then able to quickly and effectively deploy their ProfiMessage devices for their day to day requirements.

## Functions

- Acquisition, recording, analysis of measurement data
- Monitoring and automation functions
- Combined process and vibration data
- Universal analog inputs with high precision capability
- Galvanic isolation across channels
- Simple, intuitive configuration and operation
- Ethernet interface for online operation
- USB interface for data memory read out
- Two PROFIBUS interfaces (single or redundant, according to PNO 2.212 V1.2)
- Four serial interfaces
- Freely configurable CAN bus interface
- Compact, modular design
- XML format configuration

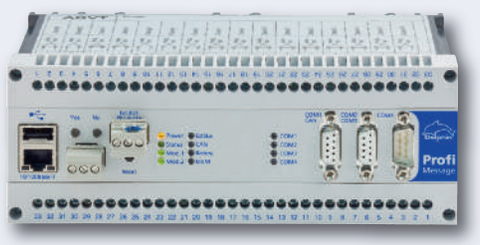
**ProfiMessage and ProfiLab with identical functions.**

### ProfiLab – for the laboratory

- Laboratory-proof, robust tabletop design
- 4 mm laboratory or BNC connectors

### ProfiMessage – for industry

- Industrial-grade, compact design for cabinet installations
- Screw terminals



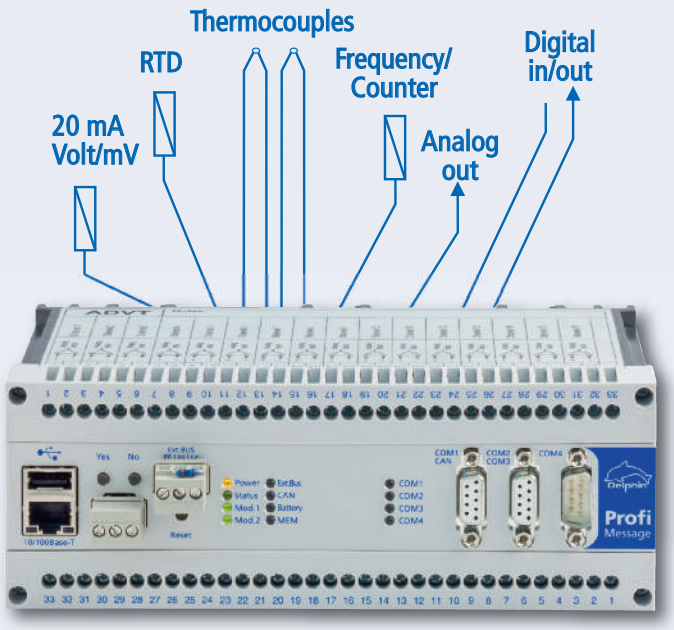
# ProfiMessage – Functions

## Universal and galvanically isolated

Depending on the type of I/O module being used, each input can be configured separately to measure mV, mA, RTDs and thermocouples. Universal inputs enable the measurement of voltages, currents or temperatures making ProfiMessage extremely flexible to deploy. ProfiMessage is also equipped with digital inputs, for functioning as status or frequency inputs, as well as digital / analog outputs.

A major benefit of the ProfiMessage device is the differential, high-precision and galvanic isolation of its inputs and outputs – isolation from channel to channel and from the power supply.

Earth loops and non-isolated sensors therefore present no problems. This unique system architecture enables problem free non-isolated measurement.




## Simple and intuitive configuration

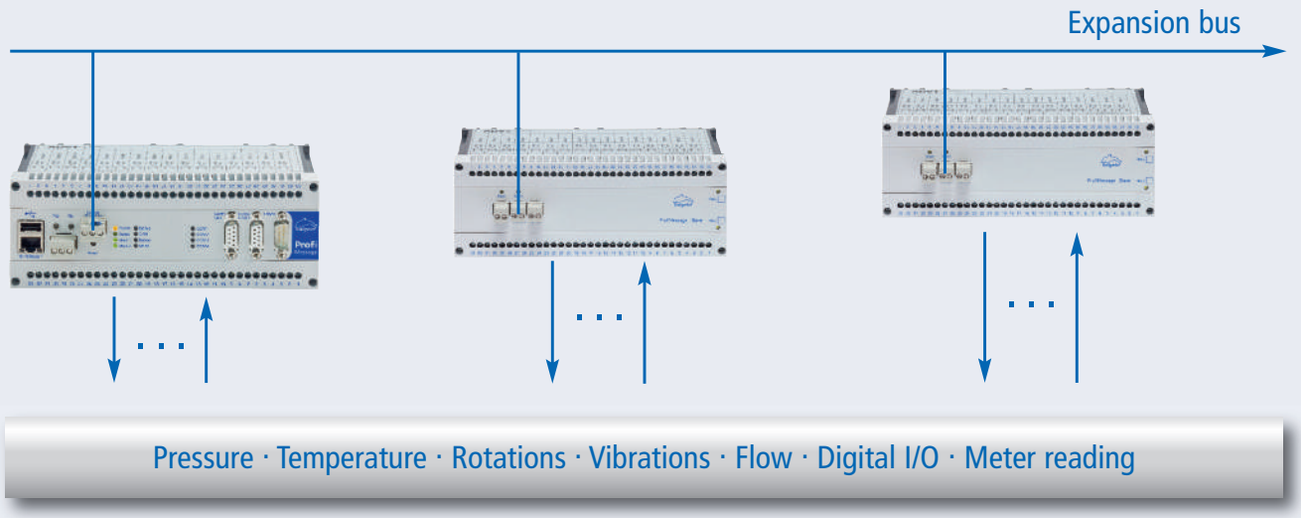
Configuration of ProfiMessage devices takes place using Configurator software that is included in delivery. The software gives a clear overview of channels, with operation being intuitive and similar to the Windows Explorer functioning. Double-clicking a channel opens a configuration dialog portraying all the channel's properties.

The individual configuration files are stored in XML format within the ProfiMessage devices and can therefore be accessed and updated offline using an XML editor.

# I/O modules

## Flexible and extendible

ProfiMessage master/slave devices can be equipped with two modules (see table bellow). Up to 20 slaves, with identical housings, can be connected to a master device. Data exchange between devices takes place via a real-time expansion bus using robust two-wire technology. Slave devices can be decentrally installed and administered from a master device. Nine different I/O modules are available for ProfiMessage. A master or slave may contain either two identical or two different I/O modules. Master devices are also available without internal I/O modules for the exclusive processing of field bus signals – such devices can then function as PLC data loggers or deployed for process fault detection and diagnostic systems.




| I/O-Modules | Analog inputs | Analog outputs | Frequency Status inputs | Status inputs | Switch outputs | Sum Samplingrate |
|---|---|---|---|---|---|---|
| **ADGT** | 8 channels, V/mV, 20 mA, RTD, thermocouples | | | | | 60 Hz |
| **ADIT** | 10 channels, V/mV, 20 mA, RTD, thermocouples | 1 channel 20 mA | | | 1 channel | 600 Hz |
| **ADVT** | 15 channels, V/mV, 20 mA, thermocouples | | | | | 600 Hz |
| **ADFT** | 8 channels V/mV, 20 mA | 2 channels 0 ... 10 V DC | 2 channels | 2 channels | 4 channels | 8 kHz |
| **AMDT** | 8 channels V/mV, 20 mA | 2 channels 0 ... 10 V DC | 2 channels | 2 channels | 4 channels | 10 ... 160 kHz |
| **AAST** | 4 channels, V/mV, 20 mA, RTD, thermocouples | 4 channels 20 mA | | 2 channels | 2 channels | 600 Hz |
| **IOIT** | | | | 24 channels | 1 channel | |
| **OTPT** | | | | 1 channel | 24 channels | |
| **DIOT** | | | 11 channels | 1 channel | 16 channels | |

# ProfiMessage – Interfaces

## A range of interfaces

ProfiMessage offers a range of field bus interfaces. A master device has two PROFIBUS DP slave interfaces (redundant according to PNO 2.212 V1.2), one Modbus TCP, one Modbus RTU, and one freely configurable CAN interface. The interfaces can also be used to connect any serial measurement devices and sensors via RS232/485. An Ethernet high-speed connection is available for connecting ProfiMessage to a PC workstation or server.

### PROFIBUS

ProfiMessage is equipped with two separate PROFIBUS DP slave interfaces. ProfiMessage integrates into PROFIBUS using GSD files. Virtually any analog or digital signal can be read or written from PROFIBUS. An option is available to switch the type of operation to redundant PNO 2.212 V1.2 PROFIBUS.

### Modbus TCP / RTU

The LAN and RS485 interfaces can also transmit data via the Modbus TCP / RTU protocol. ProfiMessage supports both Modbus master or slave operation.

### RS232 / RS485

The serial interfaces are able to function under different protocols. The protocols can be generated either by the user or by Delphin. ProfiMessage serial interfaces are being used in climate chamber operation, for laboratory equipment, for power measuring hardware and GPS receivers.

### CAN bus

The CAN bus interface can be programmed as required. Any identifier from a CAN bus can be read, scaled, processed and stored.

### LAN / TCP

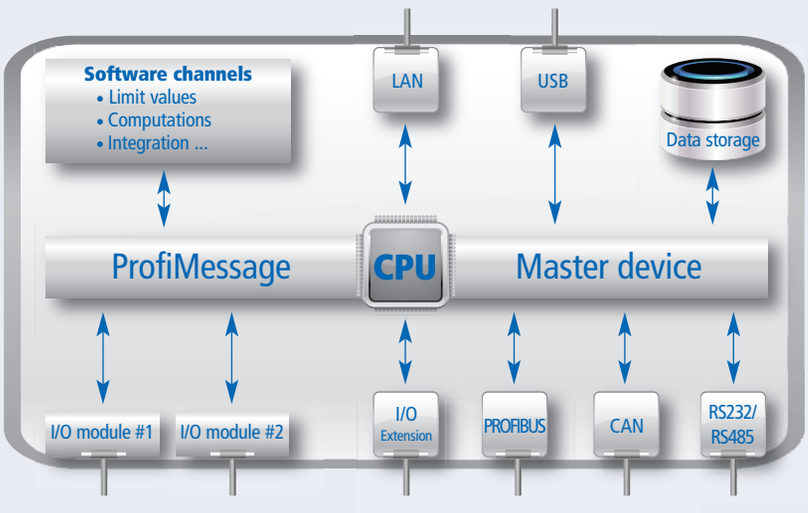
The LAN interface can be used to transmit all measurement data online, including software channels, at high speed via intranet or internet. Any networked PC can then access the ProfiMessage devices via this interface. There are also additional TCP services such as NTP, FTP, HTTP and SMTP etc. available. The device's internal data memory can also be read out via LAN.

### USB interface (Master)

The USB interface can be used to transmit data from the internal memory to USB memory stick.

### Expansion bus

The expansion bus enables up to 20 slave devices to connected to the master device.




ProfiMessage interfaces and functions

# Extended functions

## Intelligent and secure

Monitoring and automation tasks can be realised using ProfiMessage software channels. Software channels are pre-defined function modules that users can generate and configure per mouse click and then subsequently run within the device. All functions are performed autonomously by the powerful internal processor. This guarantees full operational security for the ProfiMessage device.

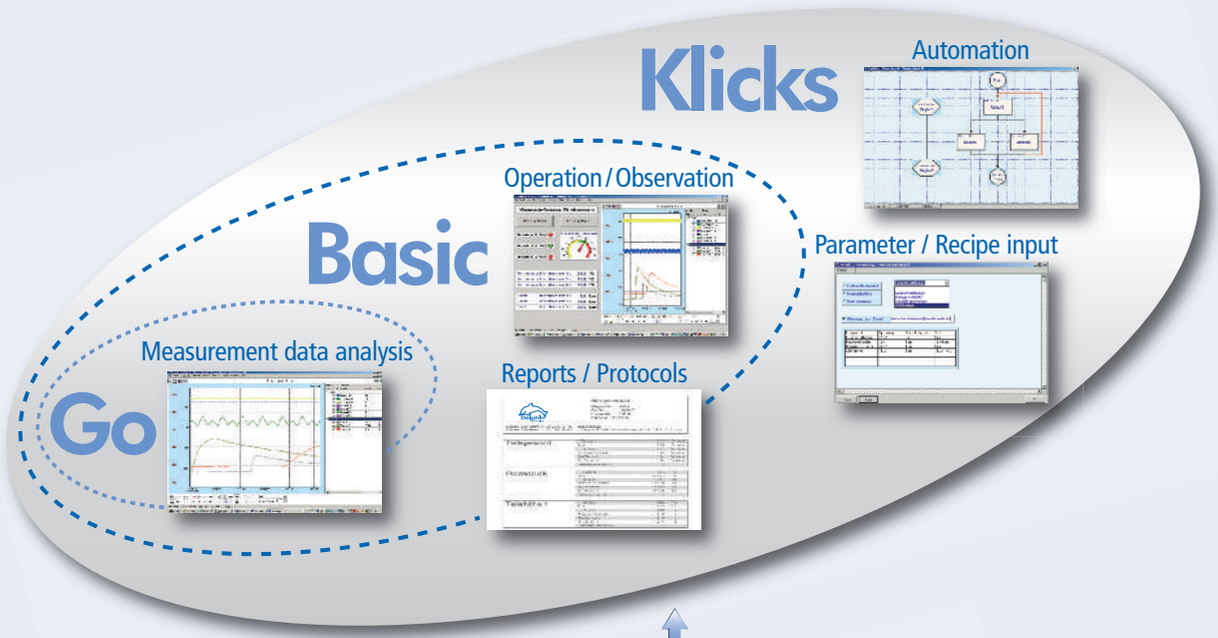
| Online analysis | Description | Examples |
|---|---|---|
| Calculation channel | Performs computations between channels. Functions include: basic arithmetic operations, trigonometry, binary and boolean functions | Calculating temperature differences between two input temperatures |
| Averaging channel | Performs computations of moving and triggered averages | Average and highly sensitive signals from thermocouples |
| Edge counter | Counter for impulses (high, low and reset-functions) | Counting energy impulses (kWh) |
| Differentiator | Computes changes taking place over time periods | Gravimetric feeders in laboratories |
| Integrator | Numerical integration over time periods | Computing volumes from flows |
| Totalling channels | Time-independent addition of measurement data | Totalling of analog measurement data |
| Linearization | Corrective computation for non-linear sensors | Linearization of a specific application PTC sensor |
| Operating hours counter | Accumulates hour times from digital signal high levels | Determining uptime / downtime patterns for machinery |
| Statistic channel | Performs computations of moving and triggered statistics (min, max, variance, standard deviation) | Determining the maximum value of an experiment |
| Stop watch | Measures time between two events | Determining switch times for valves or hermal switches |
| **Monitoring** | **Description** | **Examples** |
| Limit value | Generates an event for a limit violation (over / under runs, consistency, hysteresis, line monitoring) | Alarm for overrun of a storage temperature |
| Batch alarm | Generates an alarm from multiple digital input channels | Alarms from various parts of an installation are summarized in one notification |
| Wake-up | Generates impulses for absolute chronological events (once a day, week, month ...) | Determining daily statistics for production |
| Status monitoring | Evaluates status information from measurement data and generates alarms | Alerting of wire-breaks in an mA-signal |
| System monitor | Displays system information (CPU load, free memory capacity …) | Alerting for a full data memory |
| **Automation** | **Description** | **Examples** |
| Setpoint channel | Automates setpoint curve with reset, stop and start triggers | Automatic temperature gradient for a climate chamber |
| FlipFlop channel | RS, JK, D, FlipFlop | Records digital states |
| Impuls generator | Generates cyclical impulses | Energy counter reset, time synchronized every 15 mins |
| Logic channel | AND, OR ... | Boolean conjunctions for any digital signal |
| Timer channel | Timer functions (on / off delay) | Time delayed start of an experiment |
| Marker channel | Records constants and parameters | Process constant |

# ProfiSignal – Software for measurement

## Complete system

ProfiSignal is a complete software system for data acquisition, analysis, visualisation and automation. The software is very user-friendly and combines versatile functionality with easy operation.

ProfiSignal provides a clear and logical overview of all measurement systems: whether for single or multi-thousand channel applications. For new users, ProfiSignal is quick to learn. ProfiSignal is modular, scalable and available in three versions: Go, Basic and Klicks. Each version has backward compatibility for operability, data files and application projects.




**DataService / Configurator**

- Hardware configuration
- Data recording
- Alarms and interfaces

# and test engineering

## Overview of software modules

### ProfiSignal Go

ProfiSignal Go is a runtime system enabling measurement data to be displayed and analyzed in just three steps. The Go version is able to analyze large volumes of offline and online data.

- Data acquisition and recording
- Data analysis and calculations
- Online and offline trends
- Data export and print outs

### ProfiSignal Basic

ProfiSignal Basic, like ProfiSignal Klicks, is a developmental system for generating custom systems with visualization and trend functions.

- Operation and observation
- Process visualization
- Easy report generation

### ProfiSignal Klicks

ProfiSignal Klicks is software for test automation and the programming of control systems.

- Automating test stands and process control systems
- Automating evaluation and analysis functions
- Generating parameter graphs
- Selective frequency band evaluation

| ProfiSignal Go | ProfiSignal Basic | ProfiSignal Klicks |
|---|---|---|
| **Data acquisition** | **Monitoring** | **Automation** |
| **Runtime system** | **Development system** | **Development system** |
| Online trends | Logger substitute | Test stands |
| Historical measurement data | Fault analysis | Technical installations |
| Alarm tables | Acquisition of fault data | Laboratory automation |
| Data export | Damage diagnostics | Automated processes |
| | Quality assurance | Acquisition of operational data |
| | Remote monitoring | SQL interface |
| | | Comprehensive reporting |

Typical applications for Go, Basic and Klicks

## Measurement database included

Measurement hardware configuration takes place with the DataService / Configurator software included in ProfiSignal. The software configures hardware and software interfaces, and records data securely and permanently. The DataService saves measurement data to a database. Any ProfiSignal version on the network can then access these databases and immediately display their data as trends.

### ProfiSignal DataService / Configurator

- Configures hardware
- Records data to data files
- Records data to databases
- Calculation functions
- Monitoring functions
- Event alarms (email, text message, fax)
- User management and password protection systems
- Standard software interfaces (OPC UA, Modbus ...)
- Customized software interfaces (OCX, .NET ...)

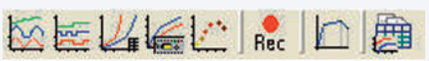
# ProfiSignal Go – Data acquisition and

## Monitoring and analysis

ProfiSignal Go enables measurement data to be saved, displayed as trends, analyzed and exported in ASCII and CSV formats. Just a few simple steps are required to go from measurement channels to trend output.

Online and offline measurement data can be continuously evaluated in trends. Go offers the following diagrams:

- y(t) diagram
- y(x) diagram
- Characteristic curve
- Oscilloscope
- Digital logical analysis




The diagrams can be run simultaneously. There are no restrictions on either the volume of measurement data or the number of channels.

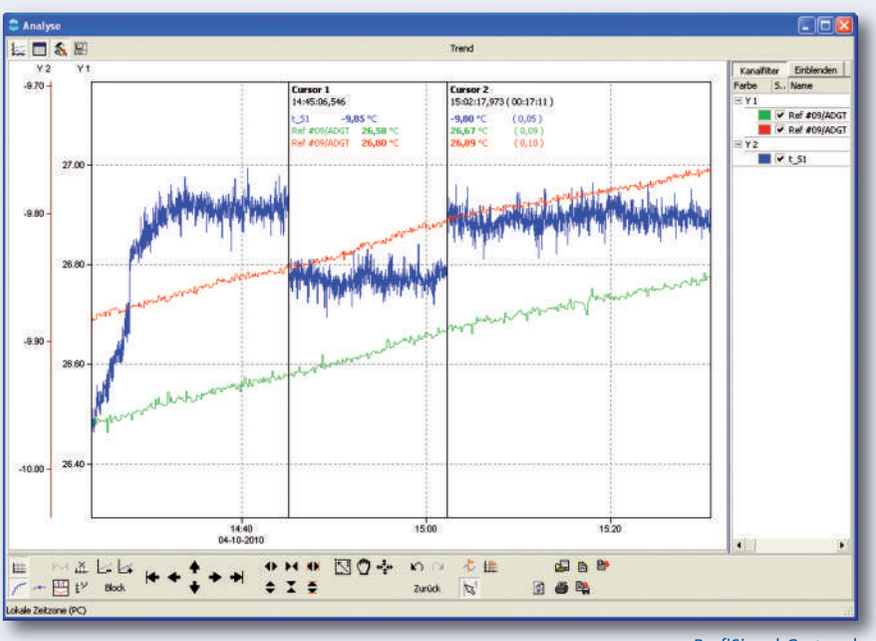
## Limitless trend options

The DataService enables uninterrupted portrayal of online and offline measurement data. Users can zoom in on archived data during a measurement run. This function is unique and especially valued by users.

ProfiSignal Go is also capable of processing large data volumes. The Go recording algorithm ensures readability of all information at the highest zoom settings. Peaks remain visible even for extremely long time ranges. This function facilitates the searching of maximum/minimum values.

## Efficient recording of measurement data

ProfiSignal Go includes the complete DataService software. This software enables convenient data storage and archiving functions. Measurement data can be stored to files or to databases.




ProfiSignal Go trend

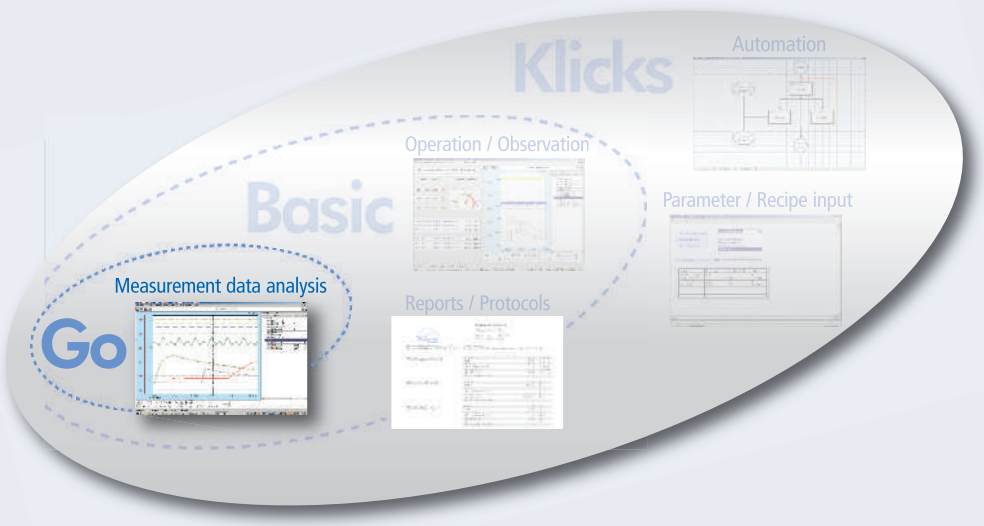
# analysis

## Product features

- Monitoring and analysis of any type of measurement data
- Recording tests to separate files
- Permanent storage to databases
- Portrayal in trends
- Uninterrupted switching to offline mode
- ASCII export as CSV files
- Print out or EMF export
- Offline calculation functions
- Statistical evaluation
- Analysis with cursor functions to µsec
- Recording of diagram configurations
- Evaluation of digital signalling processes
- Alarm functions for digital events
- Email or fax notification of alarms

## Various Applications from ProfiSignal Go

- Mobile and fixed data acquisition
- Laboratory data acquisition
- Measuring at installation
- Measuring service data
- Process data acquisition and analysis
- Fault diagnostics and recorder functions
- Experiments and testing




## A range of interfaces

ProfiSignal Go is for use with all Delphin's series. ProfiSignal Go is also equipped with an OPC Server and Client, a Modbus TCP interface and a programming interface. Drivers are also available for all the standard data acquisition systems, e.g. VXI, HBM, NI, PSI and the ADAM modules. The modular design enables inexpensive programming interfaces.

## Alarm table – monitoring and alerting

In conjunction with the DataService, ProfiSignal Go provides a diverse range of alarm and monitoring functions. In the event of alarms, digital outputs can be switched and users notified via email. An alarm table provides an overview of current and archived alarm events.

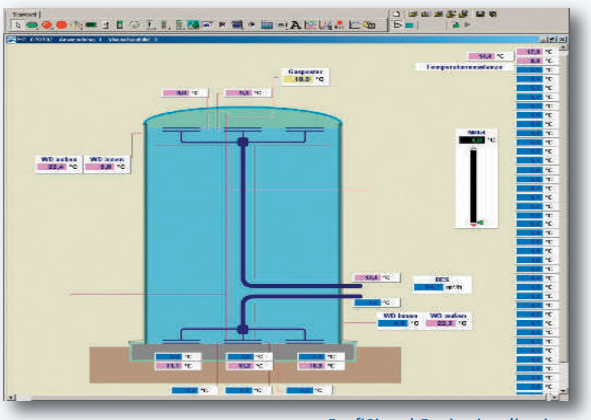
# ProfiSignal Basic – Operation and obse

## Customized applications

ProfiSignal Basic is a complete software package to meet user requirements in the fields of measurement data acquisition, operation and monitoring. Basic provides ready to use modules for:

- Acquiring measurement data
- Monitoring processes
- Operating and observing test stands
- Generating reports
- Basic automation

ProfiSignal Basic is designed to be fully configurable and compatible for continuous processes (e.g. operational data acquisition) as well as batch processes (e.g. data from experiments and trials). Basic includes basic automation functions for measurement procedures. Basic includes every function from ProfiSignal Go.



ProfiSignal Basic visualization

## Operation and monitoring

A large range of operation and observation objects enable the simple generation of process visualization diagrams. These are available with analysis functions. Operating and monitoring functions can be organized into viewing images. Even inexperienced users are able to quickly generate their own applications. These are generated in development mode and can then be switched for operation to runtime mode.


**Applications are generated with ProfiSignal in the development mode and switched to runtime mode for operation.**

## Continuous evaluation

The integrated DataService, especially suitable for large amounts of data, enables historical data to be immediately displayed on the screen at high-level resolution. Evaluation can take place from the company network or from anywhere in the world. Measurement data can be stored over extremely long periods of time. For vibration analysis or for the evaluation of transient events, data can easily be acquired and stored at kHz-sampling-levels. Recorders allow data acquired for specific tasks to be stored in separate files on the PC.

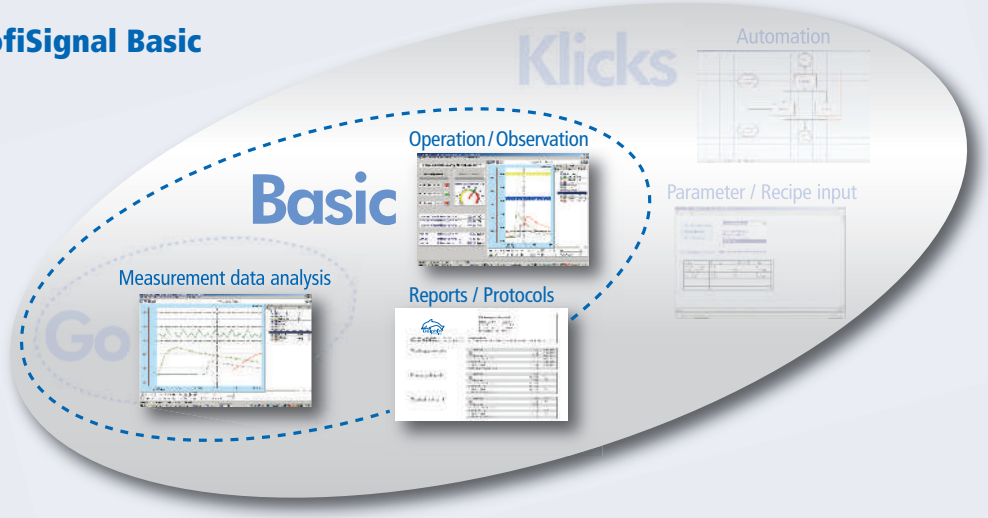
# rvation

## Product features

- Runs multiple applications simultaneously
- Diverse operating and observation functions
- Monitoring and analysis of any measurement data
- Recording data from experiments to separate files
- Permanent data storage to databases
- Portrayal of online and offline data in trends
- Basic functions for automation
- Formula editor
- ASCII data export in CSV files
- Custom-made reports
- Offline calculation functions
- Statistical evaluation
- Analysis with cursor functions to µsec resolution
- Recording of diagram configurations
- Evaluation of digital signalling processes
- Alarm functions for digital events
- Email or fax notification in alarm event

## Various Applications from ProfiSignal Basic

- Mobile and fixed data acquisition
- Laboratory data acquisition
- Test stand measurement technology
- Clean room monitoring
- Visualization of operational data
- Process data acquisition and analysis
- Experiments and tests
- Machine visualization




## Measurement data analysis

A range of diagrams are available for measurement data analysis. Y(t) diagrams enable high resolution portrayal of continuous processes over long time periods. This is particularly beneficial for quality assurance and fault diagnostic systems. Both slow and fast signals can be combined in one graph. A formula manager enables online and offline computations of measurement data as well as the recording and portrayal of computed results. Complex efficiency computations as well as basic temperature averages are simple to perform.

## Reports and protocols

As well as measurement data and computed data, a report may also contain objects such as y(t) diagram (trends), y(x) diagram (characteristic curves), tables, illustrations, input data and text. Reports can be generated and archived automatically according to time or events. This is an ideal tool for quality assurance, quality certification and accounting purposes.

# ProfiSignal Klicks – Complete with

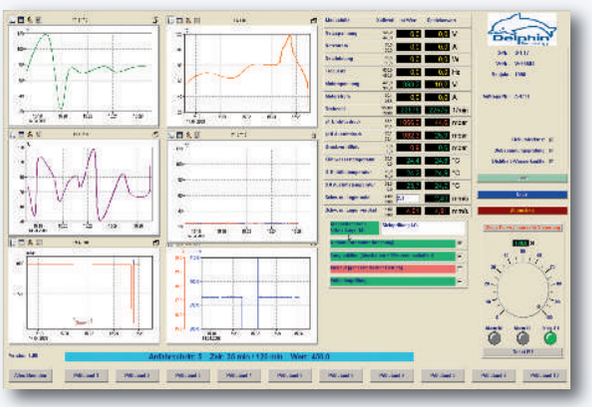
## All in one

Klicks is the complete package with the entire ProfiSignal functions in one system. Klicks includes a structure diagram in which processes can be graphically portrayed as procedure blocks. Each block is created according to "programming by selection". Programming takes place at the click of the mouse. The learning of a programming language is unnecessary. ProfiSignal includes blocks for the following tasks:

- Data acquisition
- Operating and observation
- Report generation
- Automation
- Parameter management

ProfiSignal Klicks enables test stand and laboratory automation, automated measurement data evaluation and accounting and requires no programming knowledge required.

To complete the range of functions there are input templates for test parameters and recipes and documentation functions for protocols. Klicks provides users with a single package to generate their own automating and testing applications. ProfiSignal Klicks contains all the functions from ProfiSignal Basic and ProfiSignal Go.



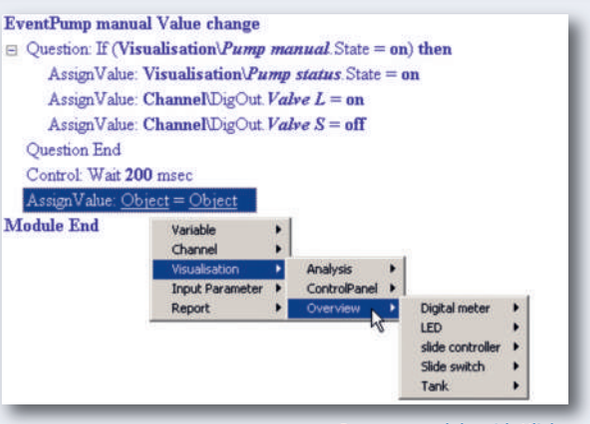
ProfiSignal Klicks visualization

## Test parameters and recipes

A parameter input screen is an important tool in test engineering and laboratory automation applications, and allows for the input of test parameters, recipes and batch data. Complete input and option templates can easily be generated, as can process visualization and viewing screens. ProfiSignal's SQL option makes it possible to import parameters directly from company databases. This reduces working times and eliminates input errors.

## Process control

Klicks has been developed for technicians, engineers and scientists who want to generate their own processing procedures but without having to invest extensive time into programming skills. The Klicks automation language does not require the learning of a programming instruction set nor the typing in of instructions and commands. This eliminates any syntax errors from occurring. Full focus can then be given to the process control – a structure chart can be generated at just a few mouse-clicks.




Program module with Klicks

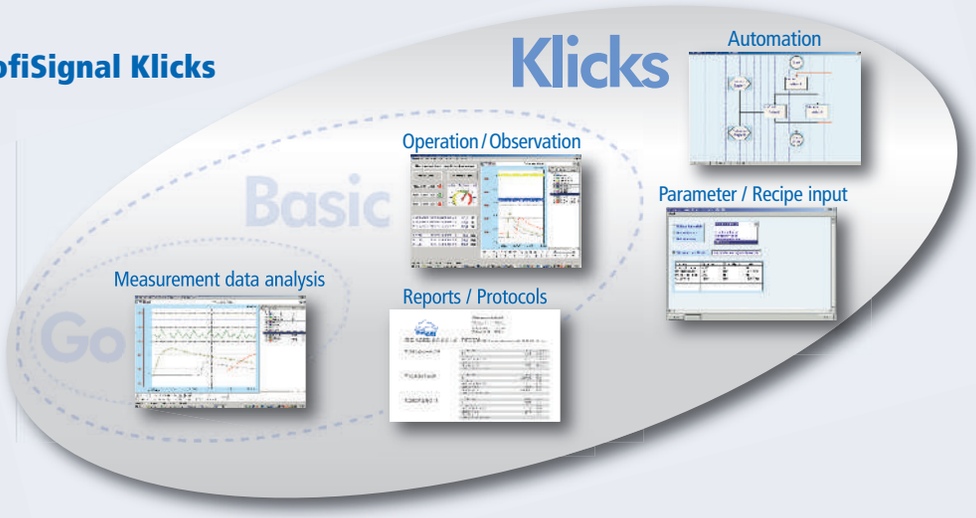
# automation

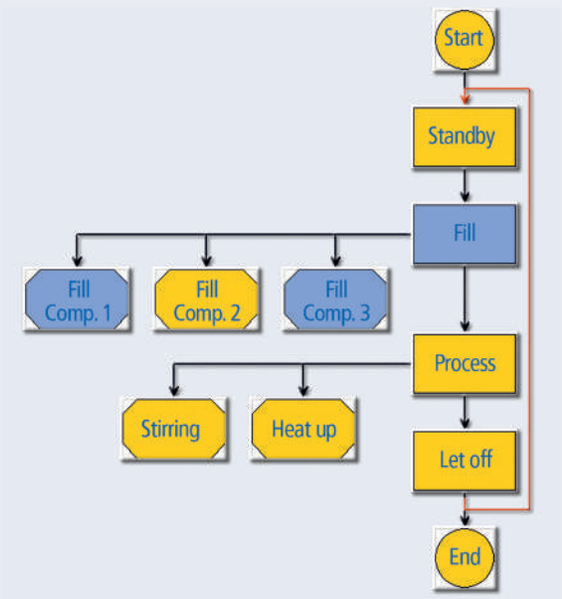
## Product features

- Synchronous or asynchronous execution of multiple applications
- Automation functions and structure charts
- Includes Klicks programming language
- Diverse operating and observation functions
- Monitoring and analysis of any measurement data
- Recording to data files and databases
- Parameter data management
- Display of online and offline data as trends
- Formula editor
- Custom reports
- Offline calculation functions
- Full trend functions

## Various Applications from ProfiSignal Klicks

- Mobile and fixed data acquisition
- Automation of test procedures
- Generation of process control
- Automation of measurement requirements
- Laboratory automation
- Product testing
- Experiments and testing




## Structure chart

The structure chart is made up of special symbols that serve as containers for programming instructions. Double clicking on a symbol opens an instruction editor. This gives users the option of maintaining and updating applications or completed programs, even years into the future.

# ProfiSignal – Interfaces, Runtime, View

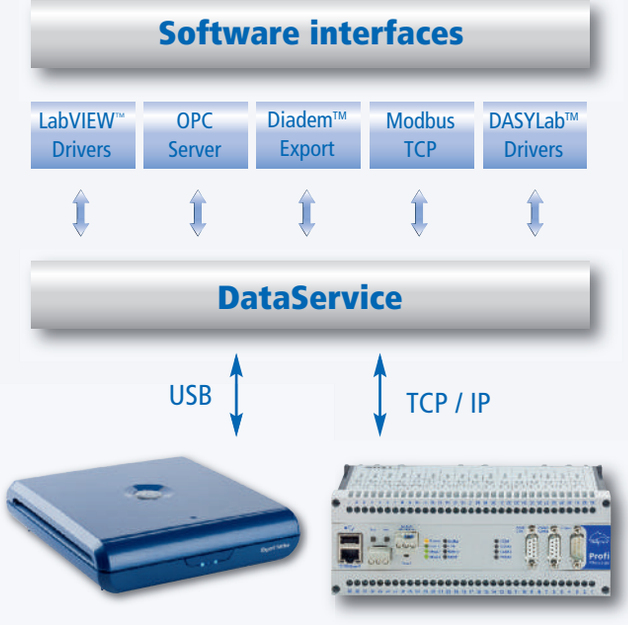
## ProfiSignal interfaces

ProfiSignal is equipped with optional interfaces for connecting external software and hardware. Drivers are available for data exchange with NI LabVIEW™, DASYLab™ and Diadem™. Sensors and other control and measurement systems can be connected to ProfiSignal via OPC Server / Client and Modbus TCP. An API interface enables ProfiSignal to be integrated into high-level languages. OCX and .NET interfaces are also available.

ProfiSignal can also be connected to external hardware. A range of drivers are available to connect external hardware. The following are examples of supported hardware: VXi, PSI, HBM, WinSocket and many others.

## Product features

- Multiple interfaces for external hardware and software
- High transfer rates supported
- Compatible with latest software versions
- Simple installation
- Full documentation




## ProfiSignal Runtime

Once a ProfiSignal project has been completed in development mode, a Runtime licence then enables its operation. ProfiSignal Runtime licence contains only ProfiSignal's runtime mode. Only completed projects that have been transferred to runtime mode can be started. Runtime mode is not intended for the creating of new projects. Runtime includes all ProfiSignal options available in the development mode.

## Product features

- Manipulation safe running of ProfiSignal projects
- Projects contained within one file
- Easy to copy applications to multiple PCs
- Inexpensive solution for OEM applications
- No development mode required

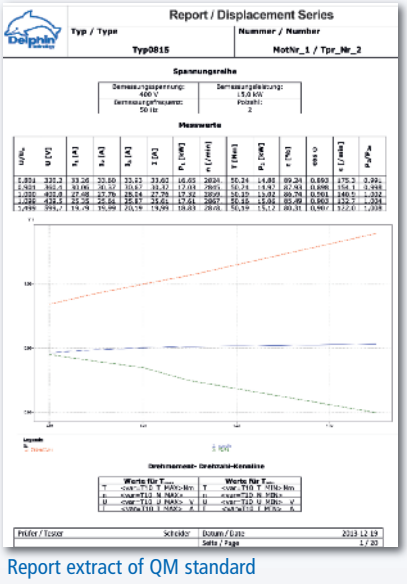
# er and ProfiSignal Web

## ProfiSignal Viewer

The ProfiSignal Viewer enables offline analysis of measurement data files and reports generated by ProfiSignal. ProfiSignal Viewer is suitable for users who require only data analysis or export, e.g. to ASCII or Excel files, and not the system's full functioning or online data features. The Viewer includes ProfiSignal options for trend diagrams and characteristic curves, e.g. cursors, markers, export and statistical functions.

## Product features

- Offline analysis and export of measurement data
- Offline analysis and processing of reports
- Diagrams, e.g. trends, characteristic curve, orbit and FFT Orbit, FFT diagrams
- Diagram functions, e.g. cursor, export, markers, statistics etc.
- Dynamic reporting with access to all measurement data plus time-stamps
- Display and processing of reports




Report extract of QM standard

## ProfiSignal Web

ProfiSignal Web visualises measurement data and processes on your tablet or smartphone. The web-based client-server solution enables a machine's current operational parameters to be displayed and checked from anywhere in the world. The web clients are compatible with any browser and any end device and require no installation. For international usage, the system has been multilingual from the outset.

## Product features

- Instant overview using individually adjustable dashboards
- Choice of a multitude of visualisation elements such as tachometers, bar graphs, LEDs, digital displays etc.
- Optimised trend portrayal for the fast visualisation of live and historical data
- Options to install the web server and store data within a measurement device, in the cloud or on a server in your company intranet
- Multiuser concept: multiple users can access the same projects simultaneously

# ProfiSignal – Options

## ProfiSignal options

A range of options are available for ProfiSignal Basic and Klicks. Single or multiple options can be acquired depending on user requirements.

## Audittrail / FDA option (Basic and Klicks)

The "Audittrail" option enables monitoring systems to be validated according to the FDA21CFR11 guidelines. The audit trail automatically logs user actions as well as changes to configuration data. The log is manipulation safe. The option also includes automated versioning of ProfiSignal projects and a full system of password protection. The monitoring of measurement data such as pressure, temperatures, air humidity, particles and status is also recorded as manipulation safe. The option "Audittrail" logs any changes to the DataService/Configurator during the development phase as well as any changes to ProfiSignal applications during runtime.

### Option Audittrail

**Audittrail**

+

**Password protection**

+

**Versioning**

+

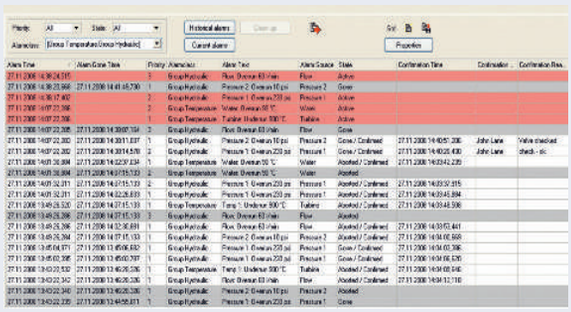
**Data encryption**

## AlarmManagement option (Basic and Klicks)

The ProfiSignal AlarmManagement option provides important additional functions concerning monitoring and alarms. An obvious requirement here is a user management system with different levels of access rights. ProfiSignal AlarmManagement functions also include alarm audit-trails and uninterrupted alarm recording.

The alarm management option records, visualizes and manages alarms. Email or fax messages can be sent in the event of an alarm:

- Any number of alarms can be set up using the DataService
- Alarm acquisition takes place with date and time recording at millisecond resolution
- Alarm notification via digital outputs using sound data formats or visualization objects
- Alarm history in the form of alarm lists



Alarm table

## SQL option (for Klicks only)

The SQL option links ProfiSignal data to company database or ERP systems:

- Integrated SQL interface for data exchange with other databases, e.g. for test sample parameters
- Connection to ProfiSignal via ODBC-functioning enabling read / write of data

## Option Vibro

The ProfiSignal Vibro option extends the existing ProfiSignal functions by the following diagrams: FFT, cascade, time signal, orbit and spectogram.

The vibro option has been specially developed for vibration measurement applications:

- Online / offline portrayal, evaluation of measured data using the Expert Vibro
- FFT, cascade, time signal and orbit diagrams

## Fully integrated in ProfiSignal

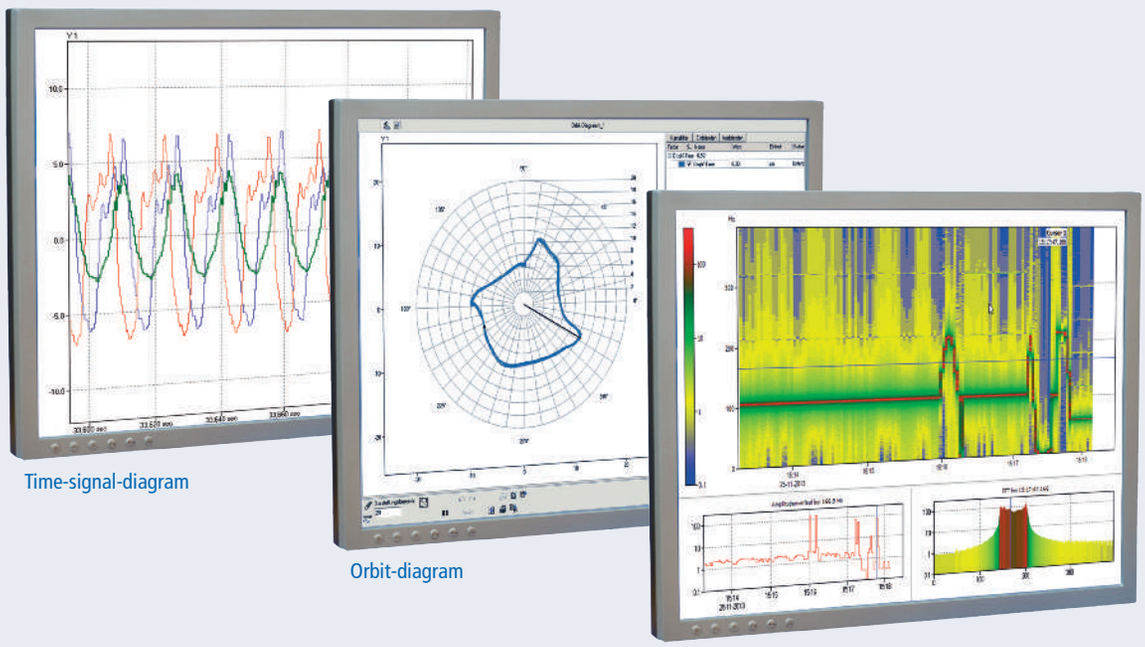
The full integration of vibration analysis into ProfiSignal means Delphin systems can be used to simultaneously portray process data and vibration data as characteristic values in digital / analog displays or in graph format.

## Unlimited documentation

A ReportGenerator enables user-defined documentation for vibration data as FFT or cascade graphs as well as envelope spectrum curve analysis. Orbit and trend graphs provide for the graphical representation of kinetic shaft orbits including maximum $S_{max}$ deflection and angular position / phase.

## Extensive range of functions in one system

The ProfiSignal Vibro option provides individual shaft vibration diagnosis in gas / steam / hydro turbines, super chargers and motors. The Vibro option can also be used for bearing vibration analysis in electric motors and roller bearings.



Time-signal-diagram

Orbit-diagram

Spectrogram

# Complete systems – mobile measurement

## Measurement case provides mobility

Users appreciate the benefits of the mobile measurement case because of its unrestricted flexibility and detailed, high-resolution measurement data, e.g. for fault analysis. An integrated data logger (14 GB) can record up to 560 million measurement values including time stamps; the data logger can operate independently, with or without PC support. Universal connectors are available for measuring mA and mV signals, thermocouple and RTD sensors as well as vibration sensors.

Internal signal conditioning simplifies working procedures and saves on the need for expensive measurement transducers or any other additional equipment. Galvanic isolation and differential inputs prevent interference from process signals or earth loops. The user-friendly ProfiSignal PC software enables acquired measurement data to be visualized, analyzed, and archived. There are also functions for the monitoring, operating and automating of entire or partial processes.

Vibration measurement case

## Vibration measurement case

The vibration measurement case is intended for practitioners in vibration measurement. With just one case, it is possible to acquire displacement, speed and acceleration signals. This option is also available for process signals.

**The measurement cases shown here are just two examples from the Delphin range. We can supply any measurement case to your specific requirements.**

Universal / energy measurement case

## Universal / energy measurement case

The universal / energy measurement case is made of an extremely robust synthetic material and can cope with any bumps or knocks during transport or operation. The measurement case can acquire 25 analog signals as required. Connection can be made with 4 mm connectors, screw terminals, thermo-connectors, BNC or user-defined connecting points. There is also an option for digital input acquisition. Power measurement is also possible.

# case and 19"-measurement devices

## 64-channel thermocouple measurement device

The 64-channel thermocouple measurement device (64-KTM) is a compact measurement system in a 19"-housing and intended for high-precision measurement of 64 thermocouples of any type. The 14 GB data memory acquires and saves the measurement results independently and over months. A TCP interface to a network is available for online measuring. The measurement channels are high resolution and can achieve, depending on thermocouple and measurement area, an absolute accuracy of < 0.2 K.

Front and back of a 64-KTM

A 64-KTM master can be extended at any time with 64-channel slave devices, with the same 19"-housing, therefore providing a total of over 5,000 measurement channels. The device includes the ProfiSignal Basic software for measurement data archiving, and online / offline measurement data analysis. A driver is also available for all current measurement technology software or API. In developing the device, particular attention was given to cold junction compensation and high-precision.

## Universal testing device

The universal testing device (UPG) enables automated testing of plant, machinery and components. Thermocouples, RTDs and other sensors can be directly connected; there is also a measuring capability for electrical AC/DC data. Setpoint and control channels provide for the automation of testing procedures.

The UPG includes a 19" tabletop housing design with a measurement data display as well as connection sockets for AC/DC data U, I and P (3-phase). On the rear side are 24 analog inputs for connecting thermocouples (any type); 8 of these have increased galvanic isolation of up to 650 VDC for potential-based temperature measurement. Parallel to these are 8 channels wired to 4 mm laboratory connectors enabling thermocouple, RTD, resistance, mA signals or DC volt signals to be measured. There are also 14 digital inputs, 18 digital outputs as well as 4 analog inputs and 4 analog outputs for control tasks.

230 V loads can be directly connected. Frequency and impulse counters up to 30 kHz are available. There are rear side screw terminals for these channels.

The device can perform measurement and control tasks entirely autarchic and independently, which is of particular benefit in endurance testing. It has an 14 GB internal memory with the user interface being a normal PC with network compatibility. The user-friendly ProfiSignal software is included in the delivery.

**The products shown here are just a few examples from Delphin's complete range of 19" products. We can supply custom-made 19" measurement systems to meet your specific requirements.**

Front and back of a UPG

# Industry solutions

## Tried and tested turnkey applications

Product development requires a multitude of tests to deliver information on quality assurance and conformity to safety and other standards. Delphin systems enable automation of the norms, standards, and directives involved in these testing and evaluation procedures.

Users of Delphin products benefit from its many years of experience and the expertise it has acquired in developing industry solutions. Delphin's standard entry products can deliver individual solutions that guarantee a long term return on your investment. The following are examples of industry solutions currently in operation.

**LPG – luminaire testing complying to EN 60598-1**

You will find more information in the detailled LPG brochure.

## Heating, cooling, and air-conditioning systems

Reducing emissions requires a multitude of high precision and complex measuring procedures. These are being performed on heating systems and their components (e.g. furnaces, boilers, hot water supplies, heat exchangers, and solar systems).

The measuring systems in operation are highly flexible and enable the connection of fluid and condensate scales, gas meters, and sensors (e.g. thermocouples, RTDs, flow meters, and pressure converters).

Testing can be run, monitored, and evaluated from a PC via integrated Ethernet interfaces.

Once testing is completed, the automatically produced reports and documentation can be read, modified, and converted into PDF format with an easy to use report viewer function. Measurement data and trend reports can be exported at a mouse click to standard software packages such as MS Office.

## Testing procedures

- Furnace data acquisition from oil, gas, and wood burning systems
- Boiler efficiency measurement
- Monitoring operation and determining standard efficiencies
- Determining performance indicators, continuous rating, and storage capacities
- Measuring start-up pressures
- Charging and heat-up patterns within storage systems
- Testing of regulating and thermostat systems

## Household appliances

A wide range of tests are required to ensure the quality of household appliances and their components and product liability legislation has increased these requirements. Lead times from product development to product launch are becoming increasingly shorter making automated testing procedures even more important. Automation is required for product certification during the development phase and for endurance testing in product quality and reliability.

Delphin testing systems in the household appliance industry feature a full range of functions and a high level of automation. All functions are available from a single desktop and range from test sample conditioning through to automated evaluation. The turnkey solutions include software and hardware tailored to individual requirements.

Complete testing system for testing of household appliance

## Testing household appliances

- Extraction hood testing according to EN 60335
- Testing of temperature controllers / switches etc.
- Mechanical and electrical endurance testing
- Development phase measurements
- Energy labelling and classifying

## Switches and components

Delphin switch-testing systems can test micro switches (used in household appliances), thermostats, temperature regulators, and power switches.

Flexible systems of hardware and software enable both endurance testing during development and end testing.

Complete testing system

## Switch testing

- Turnkey system with intuitive software
- Multiple, independent testing units within a single system and PC
- Fully automated testing and automation
- Time and cost savings in development and certification
- Testing of contact resistances, temperatures, electrical values
- Operating of mechanical equipment at the test periphery
- Documenting quality of test sample and third-party components

# Services

## Applications development by Delphin

The versatility of Message and Expert devices and the powerful ProfiSignal software means Delphin products are suited to small, simple applications as well as large, complex systems. Moreover, Delphin products can be used in virtually any branch and application field.

ProfiSignal software is a particularly powerful tool and is equipped with many practical functions. Users praise its structuring and simplicity.

Many Delphin users develop their own applications; others make use of Delphin's application development service. Our engineers have been working with our products for many years and very effective and practical.

If you use our services for application development, we will guarantee you smooth and trouble-free development of your system – from engineering through to training.

**Benefit from Delphin's turnkey application development or choose specific services and consultancy expertise to complement your own system development.**

## Services in application development

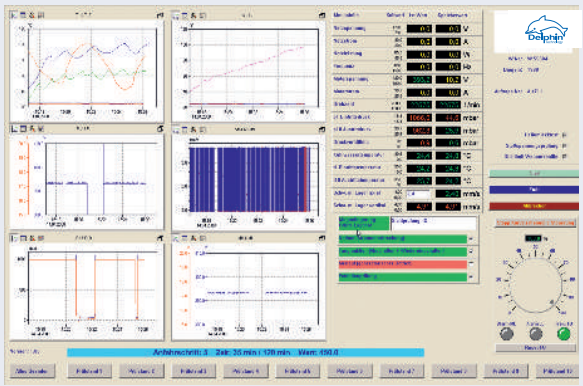
- System specification preparation
- Development of a complete ProfiSignal application
- Design and realization of visualization views for operating and observation
- Creation of input templates
- Development and testing of Klicks programming
- Layout and operation of reports and output with measurement results
- Message device configuration
- Development of serial drivers
- Development of specific software modules
- Design of cabinet constructions
- Preparing full documentation
- Software installation and software configuration
- Factory acceptance tests
- Installation and system commissioning
- User training
- Maintenance and servicing

# Application development

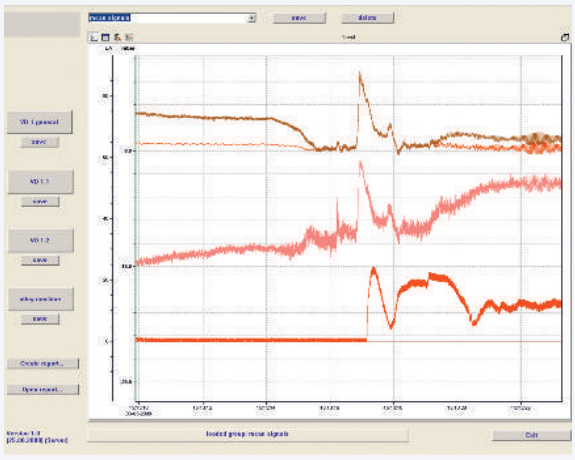
## Completed projects

### Test stand automation – compressor testing

At a pump manufacturer, simultaneous and automated production testing takes place at seven parallel test stands. Each test stand can be started and stopped from a PC. Test output is transferred via ODBC to a production database. The test commences with parameter input. The user selects from predefined test samples and determines the type of sample to be tested. The recording and saving of measurement data then occurs at the press of a button. A color-change on a digital display indicates data that is outside the permitted range.



User interface with trends and operation elements



Individual trend diagram

## Completed projects

### Environment simulation and endurance testing – climatic cabinets

Eight cooling and four climatic cabinets are being operated in a chemicals research department. The cabinets contain samples that are subjected to interference through environmental simulation. A TopMessage device saves temperatures from an RTD sensor, with the limit parameters being set at a PC. A user management system has been configured within ProfiSignal Klicks. Depending on user rights, users may view current temperatures and trends and adjust limit values. Hard-copy documentation takes place automatically.

## Cabinet construction

Delphin provides the design, manufacture, testing and documentation of individual customer solutions for cabinet construction. It includes, alongside the Message devices, all other necessary components – from power supplies through to relays. Delphin produces small housing cabinets as well as complete cabinet systems.

# Calibration

## Calibration service

Every Delphin measurement system is supplied as calibrated according to ISO 9001 and DAkkS*.

Following purchase, Delphin also provides a re-calibration service and, if required, the re-adjustment of devices and equipment.

**For both on-site calibration and calibration at Delphin, the customer receives calibration certification according to DAkkS* standards.**

*Deutsche Akkreditierungsstelle
(German Accreditation Body)

## Calibration service from Delphin

Calibration of devices at Delphin is recommended when the user has the opportunity of sending the devices to us. Just agree a date with our calibration team and send us your devices.

## On-site calibration

Major setups may be difficult to dismantle to enable off-site calibration. We therefore offer on-site calibration of your equipment. We have mobile, modern calibration instruments that allow us to perform calibration directly on your equipment and, if necessary, to make adjustments.

Mobile calibration system from Delphin

## User benefits for on-site calibration:

- Minimum downtimes because devices remain on-site
- Minimum interruption in measurement processes because devices are calibrated in series
- Fixed calibration dates
- No time or costs regarding dismantling, postage and re-installation
- No transportation risks
- Devices remain in their tempered environment

# Training – Installation – Service

## Training – general or specific

Delphin training courses inform you, with specialist and practical knowledge, of the many different applications that can be realized using ProfiSignal and Message devices. Training courses are designed according to the needs and requirements of the participants. We offer basic courses, advanced courses as well as custom-designed courses.

Training can take place either at Delphin or on-site. There are benefits in having training events exclusively intended for your staff – we can then tailor the courses directly to your specific needs and requirements.

For more information about our seminars visit us at www.delphin.com.

## Installation

Our services also include work acceptance tests and partial or full installation. We agree on a date between you and one of our experienced application engineers; this will guarantee a smooth and time-saving integration of the measurement technology into your existing hardware and software environment. You want to perform the installation yourself? We can also offer you support and advice here.

## Service packages

Our services extend far beyond the installation and user training of your measurement applications. Delphin customers are long-term customers and also benefit from our premium service packages concerning

- Maintenance and repair
- Service hotline
- Update service

We are constantly updating and extending our service provision. Visit us at www.delphin.com or call us to find out what we currently offer.

# Expert Key – Technical specifications

| | Expert Key | |
|---|---|---|
| **Device type** | **100** | **200** |
| **Analog inputs** | **14** | **28** |
| Current sources for RTD | 4 | 8 |
| Sensor types | mV, mA, thermocouples, RTD, resistance | |
| Resolution | 18 bit | |
| Total sampling rate | 100 kHz | |
| Measurement range | ± 100 / 200 / 500 mV; ± 1 / 2 / 5 / 10 V | |
| Integrated reference junctions for thermocouples | yes / 1 | yes / 2 |
| Galvanic isolation | 500 VDC to system / PE | |
| Withstand voltage | ± 40 V | |
| Max. differential voltage | ± 40 V | |
| **Analog outputs** | **2** | **2** |
| Resolution | 16 bit | |
| Max. output rate | 50 Hz | |
| Output voltage / current | 0 .. 10 V / ± 10 V / 0 .. 20 mA / 4 .. 20 mA / ±20 mA / free | |
| Galvanic isolation | 500 VDC to system / PE<br>output to output: no galvanic isolation | |
| **Digital inputs ...** | **12** | **1** |
| Logic level | low: 0 .. 1.5 V / high: 5 .. 90 VDC@2.7 mA .. 3.5 mA | |
| Max. input frequency | 2 x 1 MHz , 10 x 10 kHz | 1 x 1 MHz |
| Galvanic isolation | yes, 2.5 kVDC | |
| **... with counter function** | **12** | **1** |
| Counter resolution | 64 bit | |
| Max. input frequency / resolution | 2 x 1 MHz / 1 µs, 10 x 10 kHz / 100 µs | 1 x 1 MHz / 1 µs |
| Measurement range | 0.1 Hz .. 1 MHz or 10 kHz | |
| **Digital outputs ...** | **8** | **1** |
| Max. switching voltage / current | max. 30 W: 30 V / 1 A .. 50 V / 0.6 A | |
| Max. output rate | 10 Hz | |
| Galvanic isolation | yes, 2.5 kVDC | |
| **... with PWM function** | **4** | **1** |
| Pulse duty factor | 1:100 .. 1:500 | |
| PWM basic frequency | 5 Hz .. 10 kHz | |
| **General technical information** | | |
| Sensor connection | Screw terminals with 0.14 .. 2.5 mm² openings | |
| Power supply | External power supply | |
| Max. power input | 6 W | |
| Power supply | 9 .. 24 VDC | |
| Temperature range | 0 .. 50 °C | |
| Environmentally friendly | Conforms to RoHS | |
| USB interface | USB 2.0 high-speed | |
| Ethernet interface | 100Base-TX | |
| Expert Key L 100/200 dimensions | 50 x 185 x 215 mm | |
| Expert Key L 100/200 weight | 750 g | |
| Expert Key C 100/200 dimensions | 57 x 280 x 208 mm | |
| Expert Key C 100/200 weight | 1500 g | |
| Expert Key P 100/200 dimensions | 495 x 135 x 305 mm | |
| Expert Key P 100/200 weight | 6500 g | |
| Expert Key T 100/200 dimensions | 495 x 135 x 305 mm | |
| Expert Key T 100/200 weight | 6500 g | |

# Expert Logger – Techn. specifications

| | Expert Logger | | | |
|---|---|---|---|---|
| Device type | 100 | 200 | 300 | 400 |
| Analog inputs (mV, mA, TC) | 16 | 32 | 46 | 16 |
| Appropriate for RTD´s | 8 | 16 | 23 | 8 |
| Total sampling rate | 1000 Hz | 2 groups per 1000 Hz | 3 groups per 1000 Hz | 1000 Hz |
| Voltage / current measurement ranges | ± 156 mV .. ± 10 V / 0 .. 20 mA, 4 .. 20 mA, free | | | |
| Current reference for restistance measurement | None, 100 µA, 200 µA or 1 mA software switchable | | | |
| Strain gauge volt. ref. 5 VDC ± 10 mV | 1 | 1 | 0 | 0 |
| Resolution / input impedance | 24 bit / 1 GΩ | | | |
| Internal reference junctions | yes / 2 | yes / 4 | yes / 6 | yes / 2 |
| Withstand voltage / galvanic isolation | ± 110 VDC / ± 400 VDC to PE, other channel group | | | |
| Measurement accuracy | V / mA: 0.01 % from upper range value<br>RTD's: 0.1 K<br>Thermocouples (external thermoblock): 0.3 K<br>Thermocouples (internal reference junction): < 1.0 K | | | |
| Analog outputs | 0 | 0 | 0 | 6 |
| Resolution | 16 bit | | | |
| Output ranges | 0 .. 12 V / ±12V / 0 .. 20 mA / 4 .. 20 mA / free | | | |
| Galvanic isolation | ± 400 VDC to system / PE | | | |
| min. load / max. burden | 625 Ω / 950 Ω | | | |
| Number of digital channels | | | | |
| Digital inputs up to 1 MHz | 3 | 3 | 0 | 0 |
| Digital inputs up to 250 Hz | 1 | 1 | 0 | 1 |
| Digital outputs | 4 | 4 | 0 | 0 |
| Digital inputs / outputs | 4 | 4 | 1 | 24 |
| Technical information digital inputs | | | | |
| Input signal | low: 0 .. 1 V / high: 5 .. 100 VDC@3,5 mA | | | |
| Frequency range / resolution counter | 0.2 Hz .. 1 MHz, respectively 0.2 Hz .. 250 Hz / 64 bit | | | |
| Galvanic isolation | ± 400 VDC to PE / other channels | | | |
| Technical information digital outputs | | | | |
| Max. switching voltage / current | 50 V / 2.5 A | | | |
| PWM function / Pulse duty factor | Basic frequency 5 Hz .. 10 kHz / 1:1000 | | | |
| Galvanic isolation | ± 400 VDC to PE / other channels | | | |
| Data storage | | | | |
| Data storage internal | 2 .. 14 GB (approx. 30 million measurement values per GB) | | | |
| Data storage external | USB, NFS, CIFS, (S)FTP | | | |
| Interfaces / Protocols | | | | |
| Sensor bus SDI12 | 1 | 1 | 0 | 0 |
| COM 1 and COM 2 | RS485, 9-pole sub-D plug / ASCII, Modbus RTU, Profibus DPV1 Slave | | | |
| COM 3 | RS232, 9-pole sub-D plugs / ASCII, Modbus RTU | | | |
| LAN | 1 x 1000Base-TX | | | |
| WLAN (optional, alternative to WWAN) | 802.11 b/g/n | | | |
| WWAN (optional, alternative to WLAN) | UMTS, LTE max. 100 Mbit/s | | | |
| USB | Device 2.0 Host 2.0 / low / high / full | | | |
| TCP / IP protocols (LAN, WLAN, WWAN, USB) | Modbus TCP, OPC UA | | | |
| CAN / RS 232/485 | 2x CAN 2.0 / Modbus RTU, SCPI, ASCII | | | |
| General technical information | | | | |
| Dimensions / weight | 210 mm x 80 mm x 125 mm / 750 g | | | |
| Fixing | Rail mounting DIN EN 60715 or screw fixing | | | |
| Signal connections | Plug-in screw terminals, 96 terminals in 2 rows, max. 1.5 $mm^2$ | | | |
| Temperature range | -20 .. 50 °C | | | |
| Power supply | 12 .. 24 VDC / ± 10 % | | | |
| Power input normal mode | max. 10 W | | | |
| Power input sleep mode | 5 mW@12 V, 10 mW@24 V | | | |

# Expert Vibro – Techn. specifications

| | Expert Vibro |
|---|---|
| **Inputs / Outputs** | |
| **Analog inputs** | **8 or 16** |
| Sampling rate, adjustable per channel | 20 Hz .. 50 kHz |
| Usable signal range | DC .. 20 kHz |
| Voltage / current ranges | ± 25 V / 0 .. 20 mA / 4 .. 20 mA / free |
| Signal conditioning, software switchable | None, AC coupling, IEPE |
| Resolution / input impedance | 24 bit / 4 MΩ |
| Dielectric withstand voltage | ± 100 VDC |
| Galvanic isolation / channel to channel / channel to system / PE | ± 400 VDC |
| Measurement accuracy | 0.5 mV + 0.008 % from measurement |
| **Digital inputs** | **4** |
| Input signal | low: 0 .. 1 V / high: 5 .. 100 VDC@3.5 mA |
| Galvanic isolation / channel to channel / channel to system / PE | ± 400 VDC |
| Max. input frequency / min. pulse width | 1 MHz / 500 ns |
| **Analog outputs** | **4** |
| Resolution | 16 bit |
| Output ranges | 0 .. 10 V / ± 10 V / 0 .. 20 mA / 4 .. 20 mA / ± 20 mA |
| Galvanic isolation / channel to channel / channel to system / PE | ± 400 VDC |
| Min. load / max. burden | 650 Ω |
| **Digital outputs** | **8** |
| Switching voltage / current / PWM | 50 V / 2.5 A / galvanically isolated / 5 Hz .. 10 kHz, to 1:1000 |
| **Data storage** | |
| Internal / External | 2 .. 14 GB (approx. 30 million measurements per GB) USB, NFS, CIFS, (S)FTP) |
| **Signal conditioning functions** | |
| **High-pass / low-pass / bandpass filters** | |
| Cut-off frequency / filter order / filter characteristics | 5 Hz .. 20 kHz / 4, 6, 8, 10 / incl. Butterworth |
| **Integrator / Differentiator** | |
| Single or double integrator / differentiator | |
| **FFT** | |
| Line number/ window function / averaging | 400 .. 12.800 lines / von-Hann, Hamming, Flat-Top / 2 .. 32 times |
| FFT types | Narrow band / wide band, envelope / demodulation, amplitude / phase spectra |
| **Characteristic values from time signal** | |
| Max. / min. value, peak-to-peak value, arithm. average, TRMS, max. vect. sum, local min. / max. values | |
| **Characteristic values from frequency spectrum** | |
| Amplitude, frequency and phase of main oscillation and any harmonics, sum value, quadratic mean (in any frequency band), sum or remainder value | |
| **Characteristic values on digital input** | |
| Frequency | 1 Hz .. 1 MHz |
| Counter | 32 Bit, UP-Down counter, quadrantur decoder |
| **Interfaces** | |
| Physical equipment COM 1 / COM 2 | RS485, 9-pole sub-D plug, DIN EN ISO 19245-1 |
| Physical equipment COM 3 | RS232, 9-pole sub-D plugs |
| LAN | 1 x 1000Base-TX |
| WLAN / WWAN (optional) | 802.11b/g/n / GPRS, UMTS, LTE max. 100 Mbit/s |
| USB | Device 2.0 / host 2.0 / low / high / full |
| PROFIBUS | 2 x PROFIBUS DPV1 / Slave max. 12 Mbit, also redundant to PNO 2.212 V1.2 |
| CAN / RS 232/485 | 2 x CAN 2.0 / Modbus RTU, SCPI, ASCII |
| TCP/IP | Modbus TCP, OPC UA |
| **General technical information** | |
| Dimensions / weight | 210 mm x 80 mm x 125 mm / 750 g |
| Fixing | Rail mounting DIN EN 60715 or screw fixing |
| Signal connections | Plug-in screw terminals, 96 terminals in 2 rows, max. 1.5 $mm^2$ |
| Temperature range | -20 .. 50 °C |
| Power supply / power input | 12 .. 24 VDC, ± 10% / max. 10 W |

# Expert Transient – Tech. specifications

| | Expert Transient |
|---|---|
| **Inputs / Outputs** | |
| **Analog inputs** | **8 or 16** |
| Sampling rate, adjustable per channel | 20 Hz .. 50 kHz |
| Usable signal range | DC .. 20 kHz |
| Voltage / current ranges | ± 25 V / 0 .. 20 mA / 4 .. 20 mA / free |
| Signal conditioning, software switchable | None, AC coupling, IEPE |
| Resolution / input impedance | 24 bit / 4 MΩ |
| Dielectric withstand voltage | ± 100 VDC |
| Galvanic isolation / channel to channel / channel to system / PE | ± 400 VDC |
| Measurement accuracy | 0.5 mV + 0.008 % from measurement |
| **Digital inputs** | **4** |
| Input signal | low: 0 .. 1 V / high: 5 .. 100 VDC@3.5 mA |
| Galvanic isolation / channel to channel / channel to system / PE | ± 400 VDC |
| Max. input frequency / min. pulse width | 1 MHz / 500 ns |
| **Analog outputs** | **4** |
| Resolution | 16 bit |
| Output ranges | 0 .. 10 V / ± 10 V / 0 .. 20 mA / 4 .. 20 mA / ± 20 mA |
| Galvanic isolation / channel to channel / channel to system / PE | ± 400 VDC |
| Min. load / max. burden | 650 Ω |
| **Digital outputs** | **8** |
| Switching voltage/ current/ PWM | 50 V / 2.5 A / galvanically isolated / 5 Hz .. 10 kHz, to 1:1000 |
| **Data storage** | |
| Internal / External | 2 .. 14 GB (approx. 30 million measurements per GB) USB, NFS, CIFS, (S)FTP) |
| **Signal conditioning functions** | |
| **High pass / low pass / bandpass filters** | |
| Cut-off frequency / filter order / filter characteristics | 5 Hz .. 20 kHz / 4, 6, 8, 10 / incl. Butterworth |
| **Integrator / Differentiator** | |
| Single or double integrator / differentiator | |
| **Characteristic values from time signal** | |
| Max. / min. value, peak-to-peak value, arithm. average, TRMS, max. vect. sum, local min. / max. values | |
| **Characteristic values on digital input** | |
| Frequency | 1 Hz .. 1 MHz |
| Counter | 32 Bit, UP-Down counter, quadrantur decoder |
| **Interfaces** | |
| Physical equipmentCOM 1 / COM 2 | RS485, 9-pole Sub-D-plug, DIN EN ISO 19245-1 |
| Physical equipment COM 3 | RS232, 9-pole Sub-D plugs |
| LAN | 1 x 1000Base-TX |
| WLAN / WWAN (optional) | 802.11b/g/n / GPRS, UMTS, LTE max. 100 Mbit/s |
| USB | Device 2.0 / host 2.0 / low / high / full |
| PROFIBUS | 2 x PROFIBUS DPV1 / Slave max. 12 Mbit, also redundant according to PNO 2.212 V1.2, passive PROFIBUS sniffer |
| CAN / RS 232/485 | 2 x CAN 2.0 / Modbus RTU, SCPI, ASCII |
| TCP IP | Modbus TCP, OPC UA |
| **General technical information** | |
| Dimensions / weight | 210 mm x 80 mm x 125 mm / 750 g |
| Fixing | Rail mounting DIN EN 60715 or screw fixing |
| Signal connections | Plug-in screw terminals, 96 terminals in 2 rows, max. 1.5 mm² |
| Temperature range | -20 .. 50 °C |
| Power supply | 12 .. 24 V / ± 10 % |
| Power input | max. 10 W |

# LogMessage – Technical specifications

| | LogMessage 5000 |
|---|---|
| **Analog inputs** | |
| Quantity | 16 |
| Sensors | Thermocouples, RTD, mV, mA |
| Voltage and current measurement range | ± 156 mV .. ± 10 V / 0 .. 20 mA, 4 .. 20 mA |
| Galvanic isolation to system | 750 VDC |
| Galvanic isolation channel to channel | 650 V |
| Resolution | 24 bit |
| Measurement accuracy | V / mA: 0.01 % from upper range value<br>PT100: 0.1 K<br>PT1000: 0.05 K<br>Thermocouples: 0.1 % EV |
| **Data storage** | |
| Internal | 2 .. 14 GB (approx. 40 million measurement values per GB) |
| **Interfaces** | |
| Physical equipment COM 1 / COM 2 | RS485, 9-pole sub-D plug, DIN EN ISO 19245-1 |
| Physical equipment COM 3 / COM 4 | RS232, 9-pole sub-D plugs |
| Protocols COM 1 .. COM 4 | Modbus RTU master / slave, customer-specific protocols, ASCII |
| Ethernet | RJ45 (8-pole STP-plug), 100Base-TX<br>Protocols: TCP/IP, HTTP, SMTP, NTP, Modbus TCP Client / Server |
| USB | USB 1.1 for data memory read out |
| CAN | 9-pole sub-D plug, Protocols: CAN RAW; baud rates: 50 k .. 1 MBaud |
| **General technical information** | |
| Dimensions | 200 x 73 x 118 mm |
| Weight | 1 kg |
| Fixing | Rail mounting DIN EN 60715 or screw fixing |
| Signal connections | Detachable screw terminals, 33 terminals in 2 rows, lead protection, connecting cabling max. 2.5 mm² |
| Temperature range | -20 .. 50 °C |
| Power supply | 12 .. 36 VDC / 12 .. 28 VAC eff. / ± 10 % |
| Power input | < 10 Watt |

# ProfiMessage – Technical specifications

| | ProfiMessage / ProfiLab | | |
|---|---|---|---|
| **Analog inputs** | | | |
| Module type | ADVT / AAST / ADIT | ADGT | AMDT / ADFT |
| Sensors | mV, mA, Thermocouples, RTD (RTD except ADTV) | mV, mA, Thermocouples, RTD | mV, mA |
| Voltage and current measurement range | ± 156 mV .. ± 10 V / 0 .. 20 mA, 4 .. 20 mA | | |
| Galvanic isolation to system | 750 VDC | | |
| Galvanic isolation channel to channel | 110 V | 650 V | 100 V |
| Resolution | 24 bit | | 14 bit |
| Measurement accuracy | V / mA: 0.01 % from upper range value<br>PT100: 0.1 K<br>PT1000: 0.05 K<br>Thermocouples: 0.1 % EV | | ± 1.25 V .. ± 10 V: ± 0.1 %<br>± 0.625 V: ± 0.2 %<br>± 0.312 V: ± 0.3 %<br>± 0.156 V: ± 0.4 % |
| **Analog outputs** | | | |
| Resolution | 16 bit | – | 12 bit |
| Galvanic isolation | 750 V | – | 100 V |
| Output | 0/4 .. 20 mA | – | 0 .. 10 V |
| Max. burden / min. load | 650 Ω | – | 2,5 kΩ |
| **Digital inputs** | | | |
| Galvanic isolation | 2.5 kV | | |
| Input measurement range | low: 0 .. 1.5 VDC@0 .. 1.5 mA / high: 3.5 .. 90 VDC@2 mA | | |
| **Frequency / counter inputs** | | | |
| Galvanic isolation / input measurement range | 2.5 kV / low: 0 .. 1.5 VDC@0 .. 1.5 mA / high: 3.5 .. 90 VDC@2 mA | | |
| Measurement frequency | up to 30 kHz | | |
| **Digital outputs** | | | |
| Galvanic isolation | 2.5 kV | | |
| Switching voltage | max. 50 VDC@2.5 A | | |
| **Data storage** | | | |
| Internal | 2 .. 14 GB (approx. 40 million measurement values per GB / 300 millionen measurement values per GB for AMDT, ADFT) | | |
| **Interfaces** | | | |
| Physical equipment COM 1 / COM 2 | RS485, 9-pole sub-D plug, DIN EN ISO 19245-1 | | |
| Physical equipment COM 3 / COM 4 | RS232, 9-pole sub-D plugs | | |
| Protocols COM 1 / COM 2 | PROFIBUS DPV1 Slave (both interfaces), incl. redundancy according to PNO 2.212 V1.2 | | |
| Protocols COM 1 .. COM 4 | Modbus RTU master / slave, customer-specific protocols, ASCII | | |
| Ethernet | RJ45 (8-pole STP-plug), 100Base-TX<br>Protocols: TCP/IP, HTTP, SMTP, NTP, Modbus TCP Client / Server | | |
| USB | USB 1.1. for configuration and data memory read out | | |
| CAN | 9-pole sub-D plug, Protocols: CAN, RAW; baud rates: 50 k ..1 MBaud | | |
| **Module bus** | | | |
| Mechanical type | 3-pole Phoenix connector; internal bus to connect additional modules | | |
| Baud rate / length | 1 MBaud (adjustable) / up to 10 m | | |
| **General technical information** | | | |
| ProfiMessage dimensions / weight | 200 x 73 x 118 mm / 1 kg | | |
| ProfiMessage fixing | Rail mounting DIN EN 60715 or screw fixing | | |
| ProfiMessage signal connections | Detachable screw terminals, 33 terminals in 2 rows, lead protection, connecting cabling max. 2.5 $mm^2$ | | |
| ProfiLab dimensions / weight | 226 x 145 x 180 mm / 1 kg | | |
| ProfiLab signal connections | Up to 64 4 mm lab plugs, gold-plated | | |
| Temperature range | -20 .. 50 °C | | |
| Power supply | 12 .. 36 VDC / 12 .. 28 VAC eff. / ± 10 % | | |
| Power Input | < 10 Watt | | |

Delphin Technology

Delphin Technology AG
Lustheide 81
51427 Bergisch Gladbach · Germany

Phone +49 (0) 2204 97685-0
Fax +49 (0) 2204 97685-85
info@delphin.de · www.delphin.com

Layout: www.team-mt.de, edition 7 03/18