

Product catalogue



2018/2019

Measuring. Testing. Automation.



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.

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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.

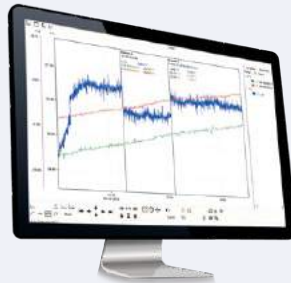


Customer services

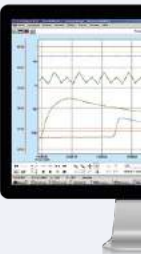
Customer service has top priority at Delphin. Our services include project planning, system installation, calibration, hotline services, courses, and project-based, tailor-made training sessions. System installation and training is carried out by a competent team of experienced engineers either at Delphin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

Delphin – Product overview

Technology



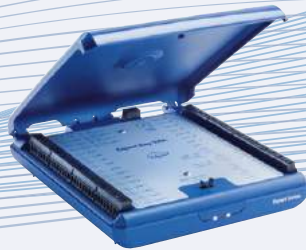
ProfiSignal Go
Data acquisition and analysis



ProfiSignal
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



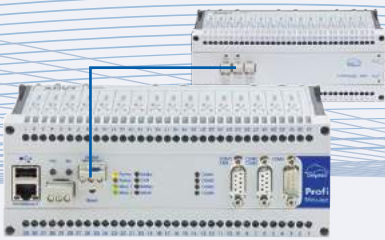
Test, trial and automation



ProfiSignal Basic
Monitoring and automation



ProfiSignal Clicks
Automation



ProfiMessage
Modular measurement
technology and automation



LogMessage
Highest galvanic
isolation



Compact measurement
system



Monitoring and environmental technology



Vibration measurement

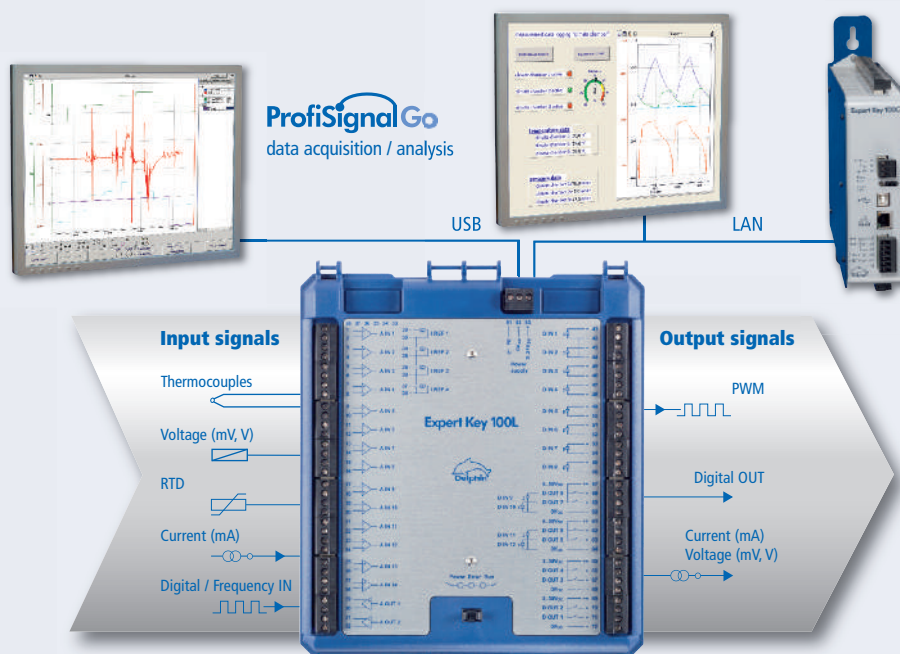
Expert Key – PC-supported measurement

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 measurement (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 alternative 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

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 mm² 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

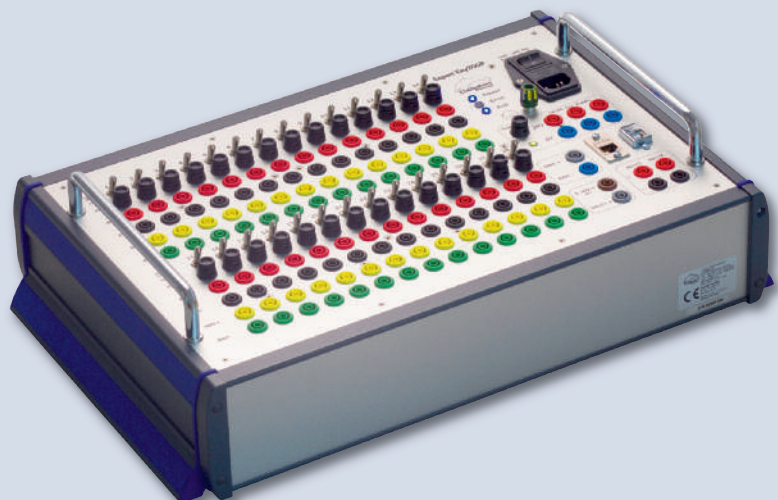
The Expert Key 100L and 200L have a tabletop design. A pop-up lid gives a clear overview of connections. Sensors and actuators are connected via plugs located on the sides. Because of the L model's universal capabilities, it is particularly suited to laboratory, experiment, test and service applications.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

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

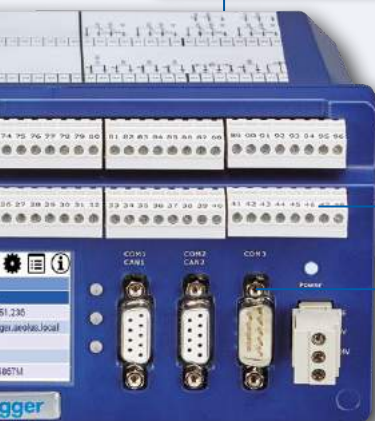
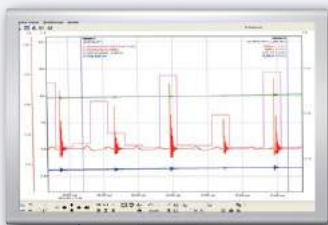
- 2 GB of internal data storage for up to 60 million measurement values
- Expandable to 4 GB up to 420 million measurement values
- Time stamps to msec resolution
- Data read out via LAN, WLAN, LTE or USB interface
- Event-triggered recording with pre and post histories

er. Latest communication technologies.

External data storage

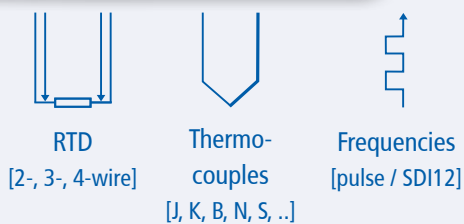
- Data recorded to external storage media (USB, NAS)
- PUSH function to send measurement data to the internet

ProfiSignalGo



SDI12

RS485/232



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

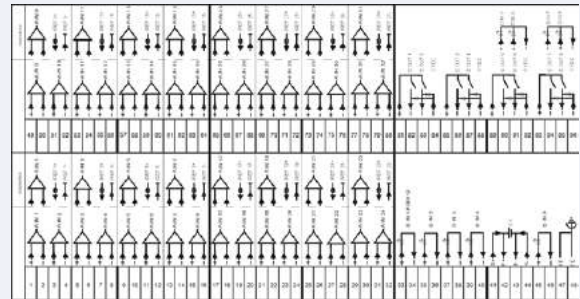
Expert Logger – Simple to operate

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 $\pm 25V$
- 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

Acceleration, Distance, Power, Voltage, Frequency

Wi-Fi / LTE UMTS

LAN



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.

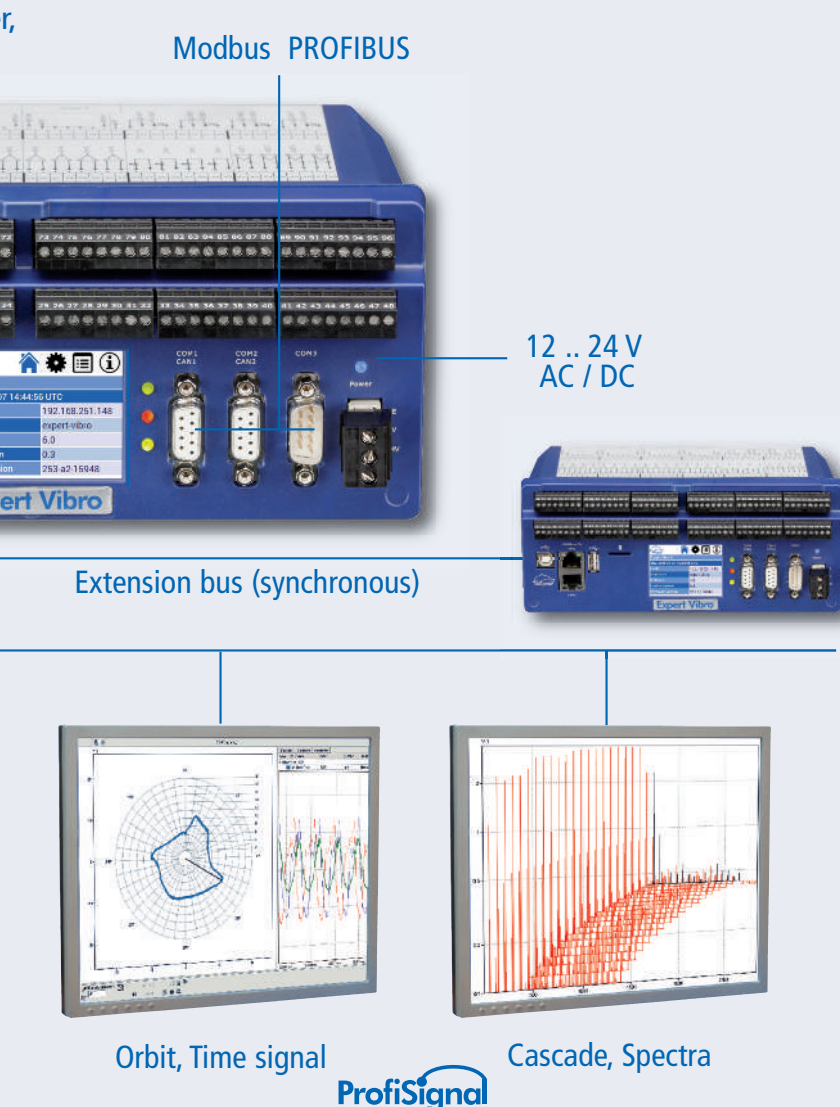
Expert Vibro

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.



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

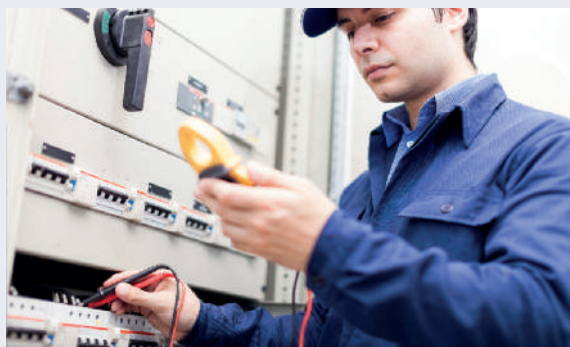
- Fast limit value monitoring of time signals
- Monitoring of characteristic values
- Online transfer of measurement data
- Spectrum – online – up to 12,800 lines (FFT)
- Versatile characteristics (characteristic values for phase, frequency and amplitude)
- Accounting and statistics function
- Integration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

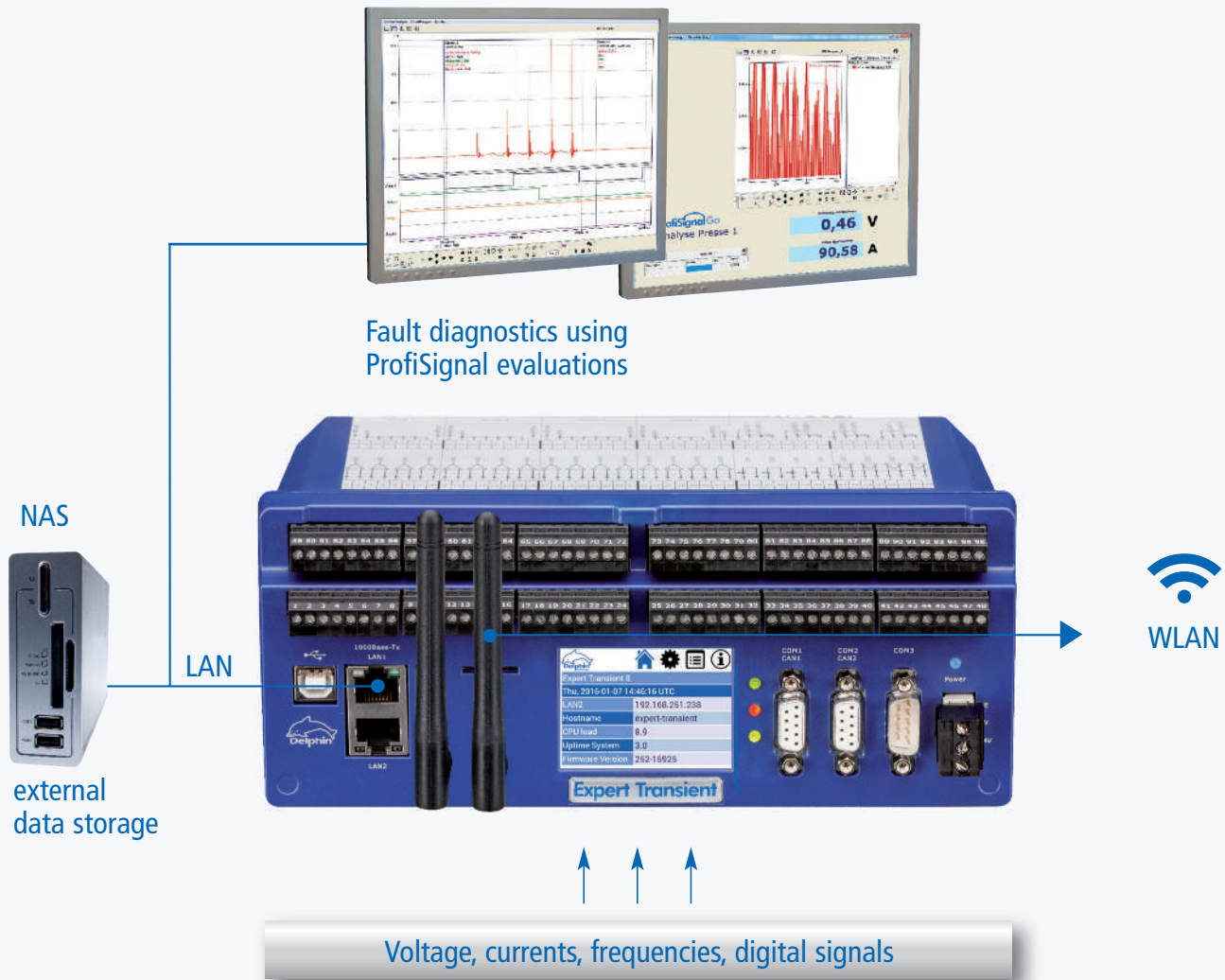
- Online computation of effective and peak values

Accessories

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

diagnostics, transient data acquisition

Evaluation using ProfiSignalGo



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.

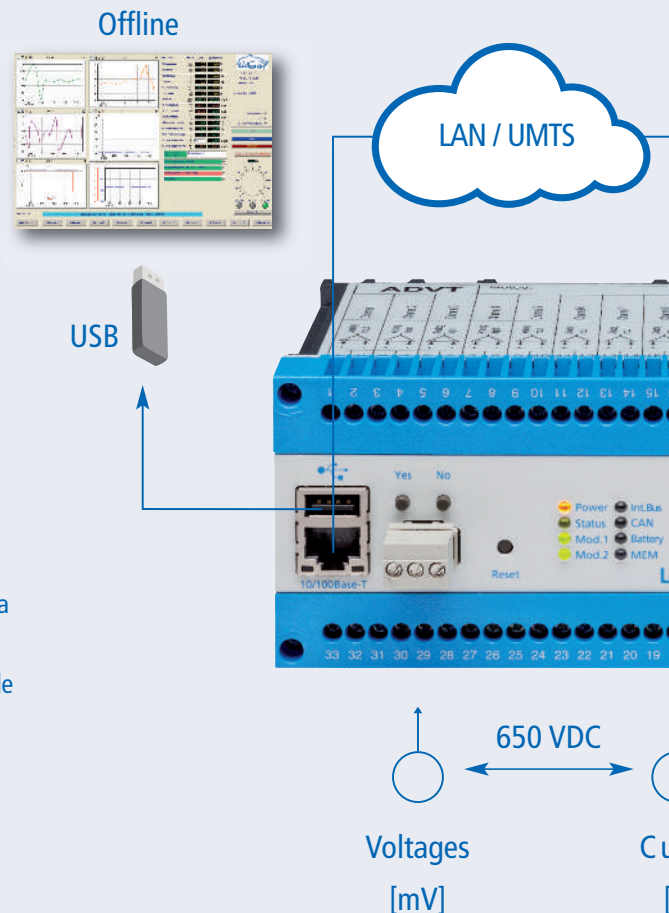
A range of interfaces

- 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.

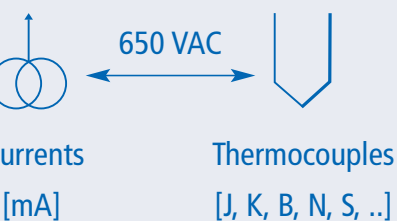
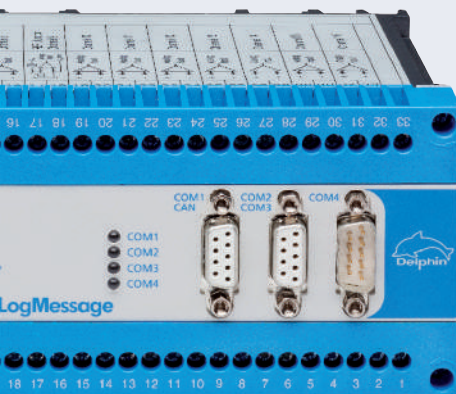
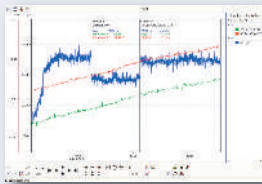
- All analog inputs can function as differential inputs
- Isolation voltage between analog inputs: up to maximum of 650 VDC
- Galvanic isolation between power supply and each interface
- No earth loop problems

olution

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

Online



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 acquisition

Modular and secure

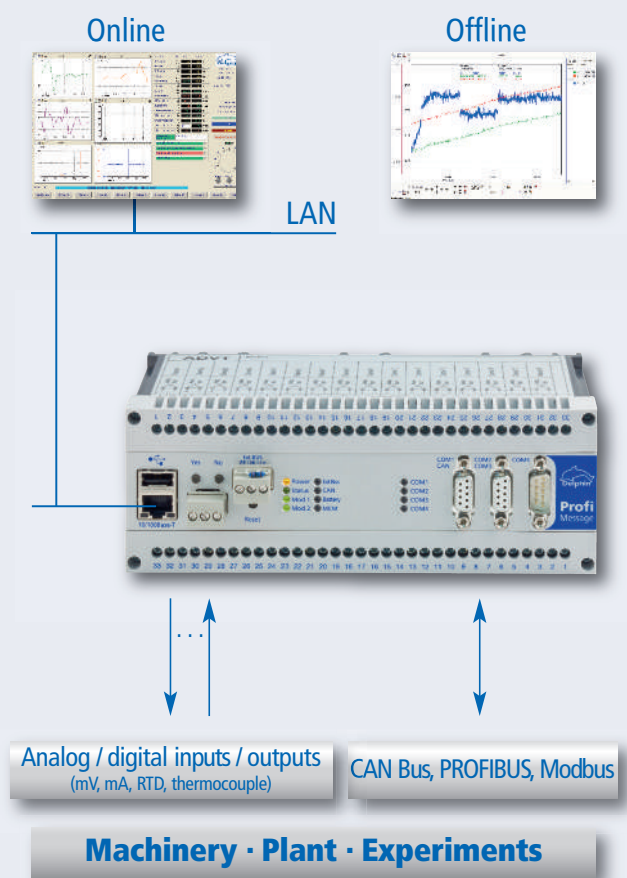
ProfiMessage is the modular system for data acquisition, monitoring and automation of machinery, plant and test stands. ProfiMessage uses master and slave devices and a range of I/O modules to enable it to be adapted to any application.

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 pre-defined 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



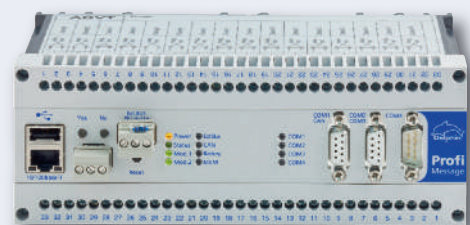
ProfiMessage and ProfiLab with identical functions.

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



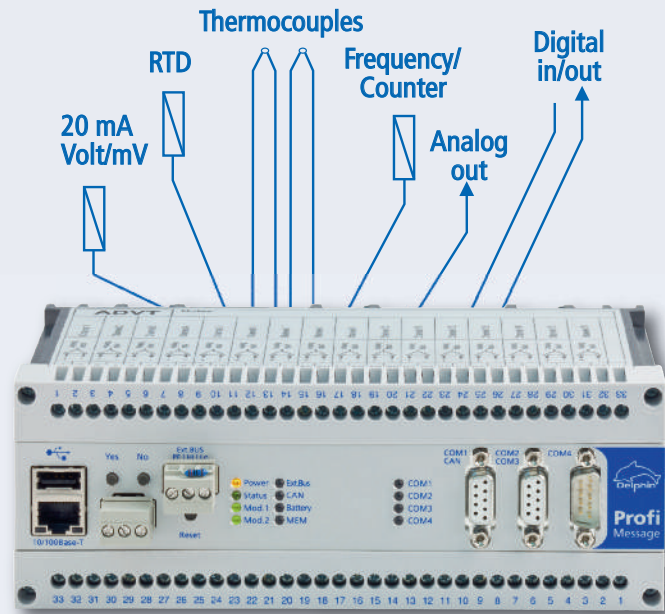
ProfiMessage – Functions

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.

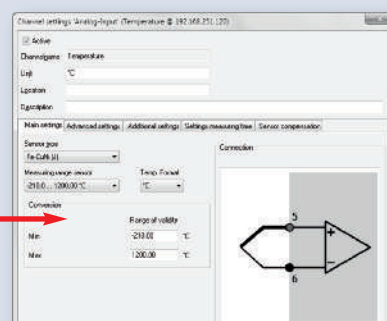
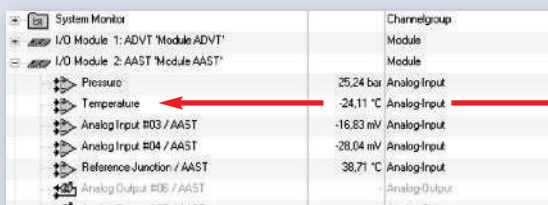
Earth loops and non-isolated sensors therefore present no problems. This unique system architecture enables problem free non-isolated measurement.



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.

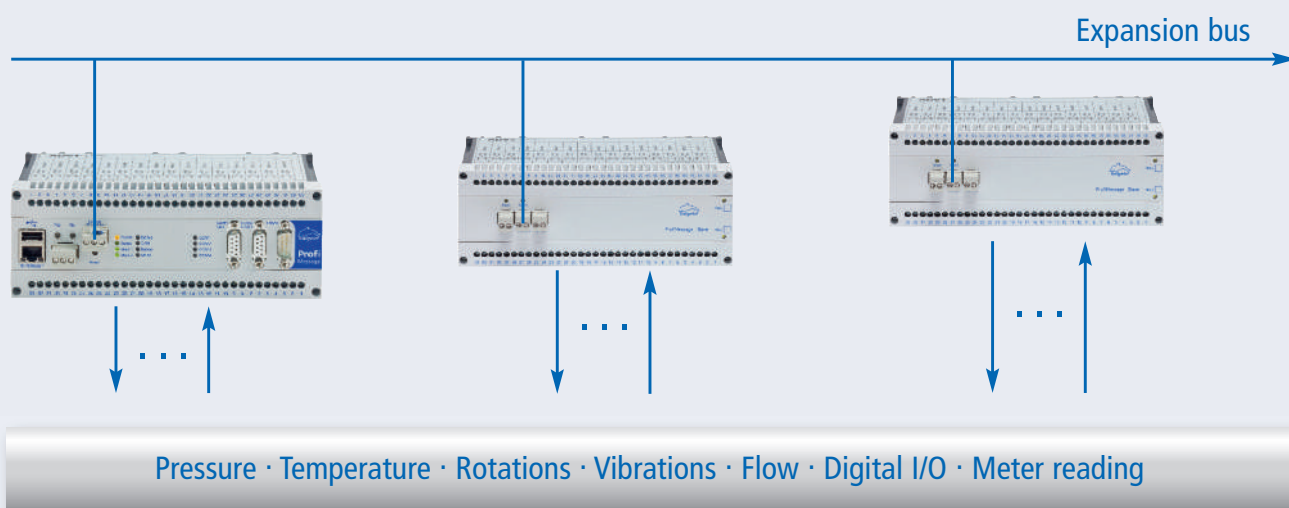


I/O modules

Flexible and extendible

ProfiMessage master/slave devices can be equipped with two modules (see table below). 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

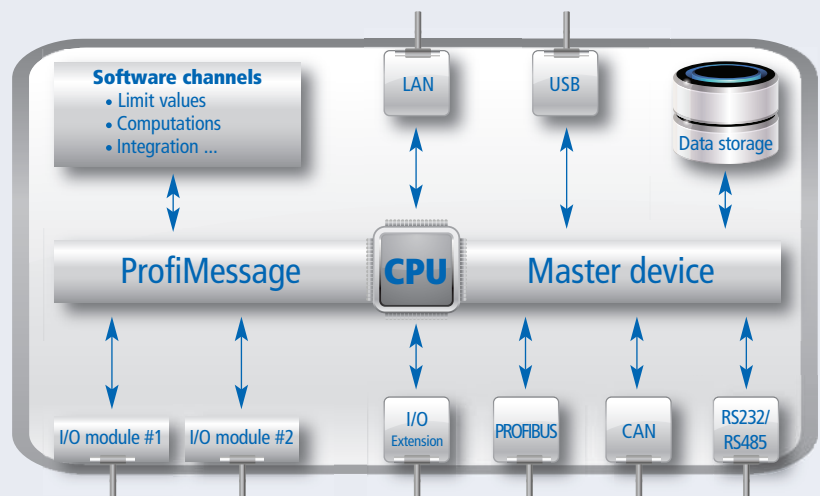
The LAN interface can be used to transmit all measurement data online, including software channels, at high speed via intranet or internet. Any networked PC can then access the ProfiMessage devices via this interface. There are also additional TCP services such as NTP, FTP, HTTP and SMTP etc. available.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

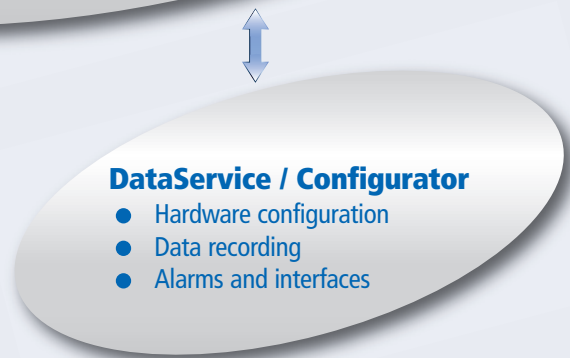
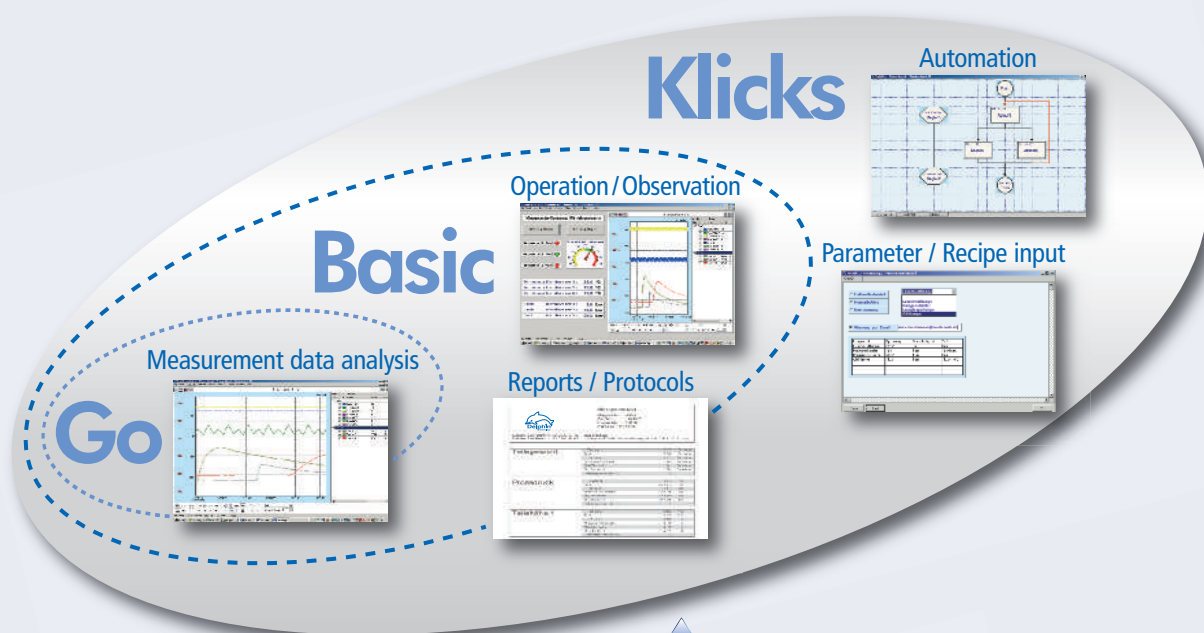
Online analysis		Description	Examples
 Calculation channel	Performs computations between channels. Functions include: basic arithmetic operations, trigonometry, binary and boolean functions	Calculating temperature differences between two input temperatures	
 Averaging channel	Performs computations of 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 Kicks. Each version has backward compatibility for operability, data files and application projects.



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 ...)

ProfiSignalGo – 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.

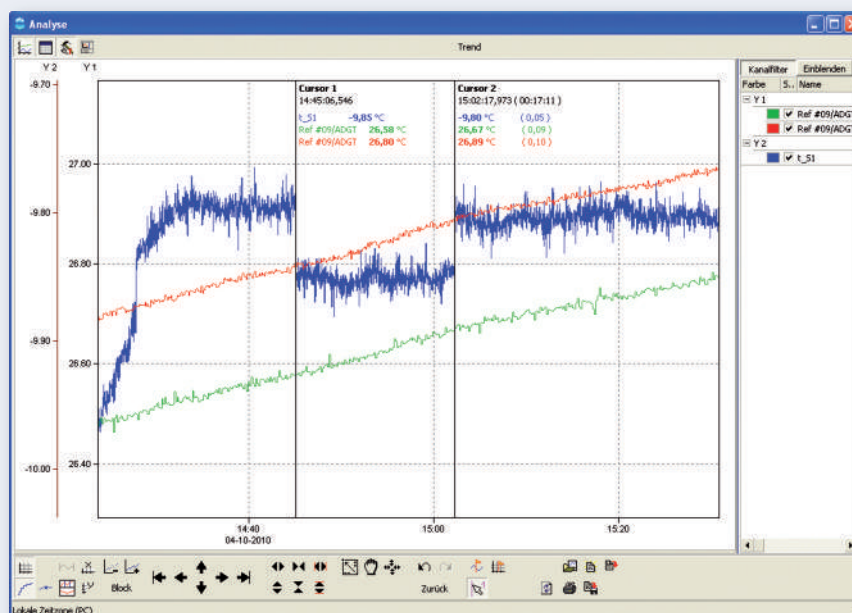
Limitless trend options

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

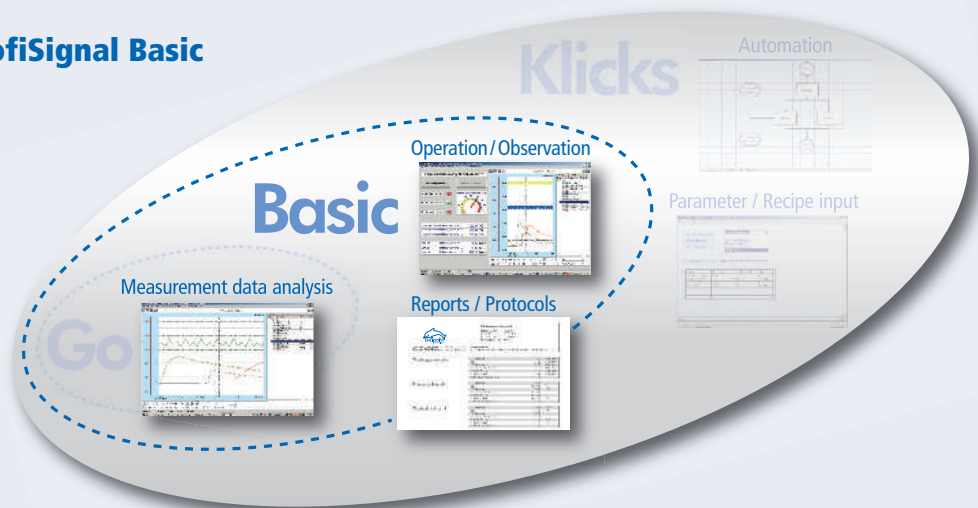
In conjunction with the DataService, ProfiSignal Go provides a diverse range of alarm and monitoring functions. In the event of alarms, digital outputs can be switched and users notified via email. An alarm table provides an overview of current and archived alarm events.

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

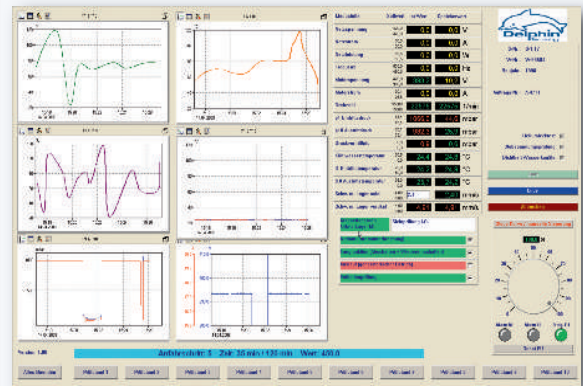
All in one

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

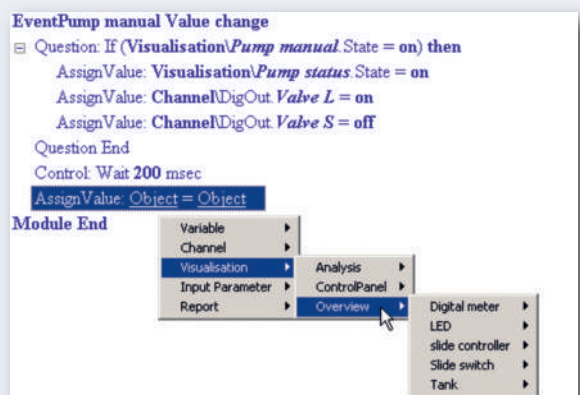
Test parameters and recipes

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

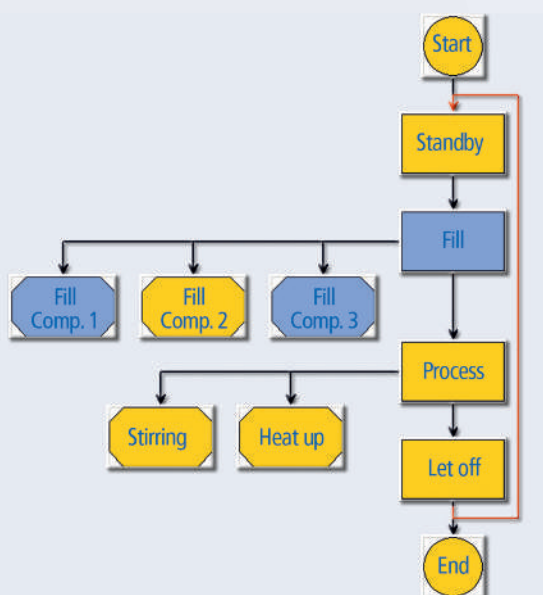
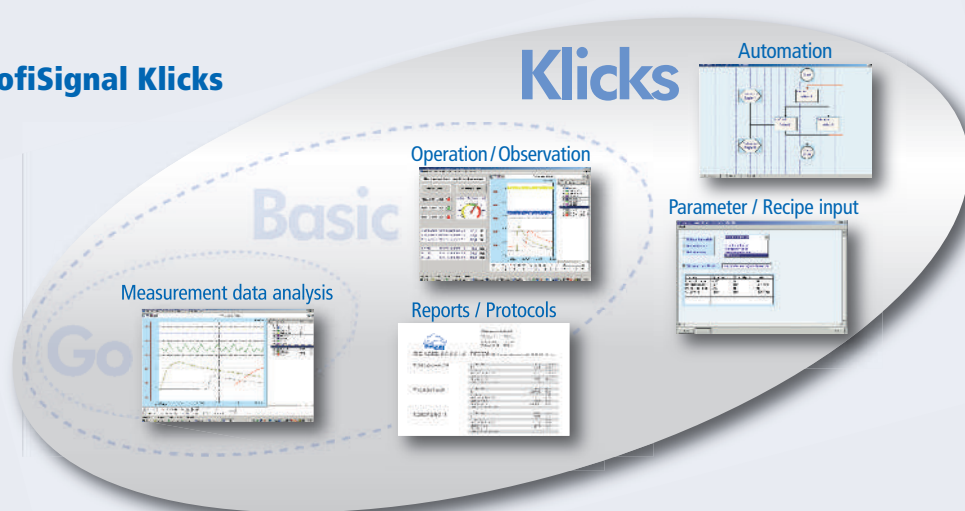
automation

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

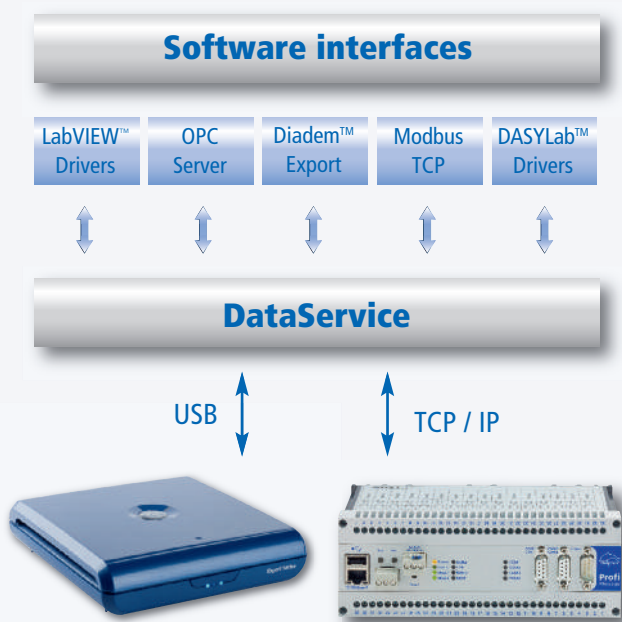
ProfiSignal interfaces

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



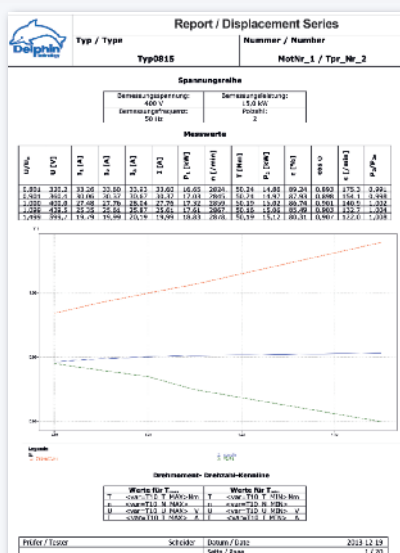
er and ProfiSignal Web

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 Time	Alarm Group	Priority	Alarm Name	Alarm Type	Alarm Source	State	Confirmation Time	Contributor	Confirmation Res.
27.11.2008 14:36:31.015	Group Hydraulic	3	Group Hydraulic	Flow	Pressure 1	Active			
27.11.2008 14:36:31.040	Group Hydraulic	3	Group Hydraulic	Flow	Pressure 2	Active			
27.11.2008 14:36:31.042	Group Hydraulic	3	Group Hydraulic	Flow	Pressure 1	Active			
27.11.2008 14:36:31.044	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.046	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.048	Group Hydraulic	3	Group Hydraulic	Flow	Pressure 1	Active			
27.11.2008 14:36:31.050	Group Hydraulic	3	Group Hydraulic	Flow	Pressure 2	Active			
27.11.2008 14:36:31.052	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.054	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.056	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.058	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.060	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.062	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.064	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.066	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.068	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.070	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.072	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.074	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.076	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.078	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.080	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.082	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.084	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.086	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.088	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.090	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.092	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.094	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.096	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.098	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.100	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.102	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.104	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.106	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.108	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.110	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.112	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.114	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.116	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.118	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.120	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.122	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.124	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.126	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.128	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.130	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.132	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.134	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.136	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.138	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.140	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.142	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.144	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.146	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.148	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.150	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.152	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.154	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.156	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.158	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.160	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.162	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.164	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.166	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.168	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.170	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.172	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.174	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.176	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.178	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.180	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.182	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.184	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.186	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.188	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.190	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.192	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.194	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.196	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.198	Group Temperature	3	Group Temperature	Water	Water	Active			
27.11.2008 14:36:31.200	Group Temperature	3	Group Temperature	Water	Water	Active			

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 spectrogram.

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

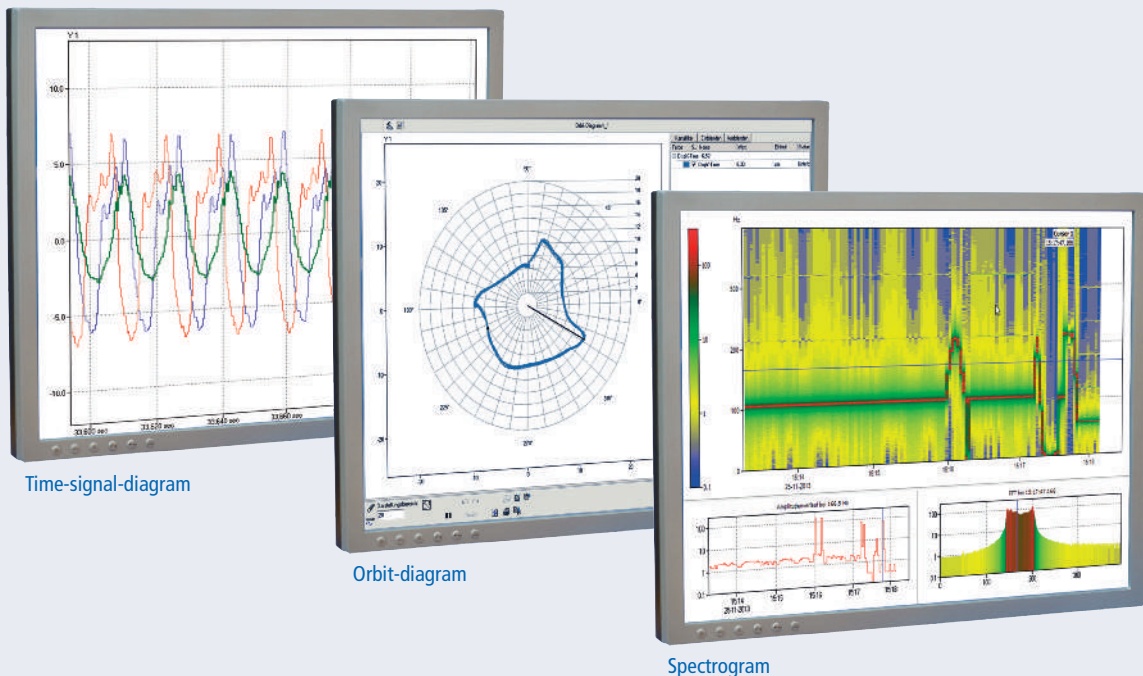
The full integration of vibration analysis into ProfiSignal means Delphin systems can be used to simultaneously portray process data and vibration data as characteristic values in digital / analog displays or in graph format.

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, superchargers and motors. The Vibro option can also be used for bearing vibration analysis in electric motors and roller bearings.



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



Universal / energy 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.

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.



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

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.



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.

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.



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 detailed 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 effectively and practically.

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

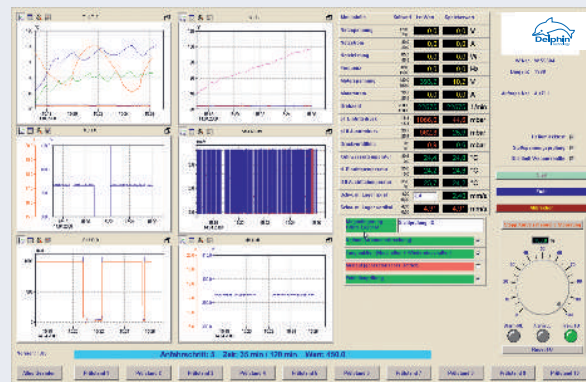
- System specification preparation
- Development of a complete ProfiSignal application
- Design and realization of visualization views for operating and observation
- Creation of input templates
- Development and testing of Klicks programming
- Layout and operation of reports and output with measurement 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

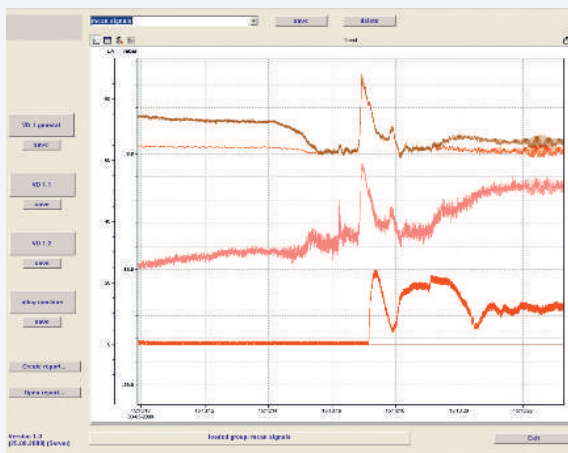
Completed projects

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

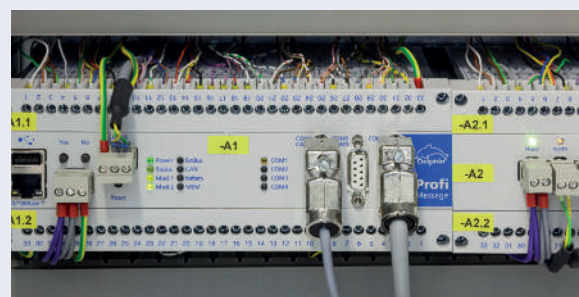
Completed projects

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

	100	200
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	$\pm 100 / 200 / 500$ mV; $\pm 1 / 2 / 5 / 10$ 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 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 μ s, 10 x 10 kHz / 100 μ s	1 x 1 MHz / 1 μ s
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 mm ² 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 resistance 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			
	RTD's: 0.1 K			
	Thermocouples (external thermoblock): 0.3 K 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, quadratur 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	$\pm 25\text{ V} / 0 \dots 20\text{ mA} / 4 \dots 20\text{ mA} / \text{free}$
Signal conditioning, software switchable	None, AC coupling, IEPE
Resolution / input impedance	24 bit / 4 M Ω
Dielectric withstand voltage	$\pm 100\text{ VDC}$
Galvanic isolation / channel to channel / channel to system / PE	$\pm 400\text{ VDC}$
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	$\pm 400\text{ VDC}$
Max. input frequency / min. pulse width	1 MHz / 500 ns
Analog outputs	4
Resolution	16 bit
Output ranges	0 .. 10 V / $\pm 10\text{ V} / 0 \dots 20\text{ mA} / 4 \dots 20\text{ mA} / \pm 20\text{ mA}$
Galvanic isolation / channel to channel / channel to system / PE	$\pm 400\text{ VDC}$
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 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 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 mm ²
Temperature range	-20 .. 50 °C
Power supply	12 .. 24 V / $\pm 10\%$
Power input	max. 10 W

LogMessage – Technical specifications

LogMessage 5000

Analog inputs	
Quantity	16
Sensors	Thermocouples, RTD, mV, mA
Voltage and current measurement range	$\pm 156 \text{ mV} \dots \pm 10 \text{ V} / 0 \dots 20 \text{ mA}, 4 \dots 20 \text{ mA}$
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 PT100: 0.1 K PT1000: 0.05 K 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 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 mm ²
Temperature range	-20 .. 50 °C
Power supply	12 .. 36 VDC / 12 .. 28 VAC eff. / $\pm 10 \%$
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 PT100: 0.1 K PT1000: 0.05 K Thermocouples: 0.1 % EV		± 1.25 V .. ± 10 V: ± 0.1 % ± 0.625 V: ± 0.2 % ± 0.312 V: ± 0.3 % ± 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 million 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		
USB	Protocols: TCP/IP, HTTP, SMTP, NTP, Modbus TCP Client / Server		
CAN	USB 1.1. for configuration and data memory read out		
	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		

