ProfiMessage – Modular data acquisitio

Modular and secure

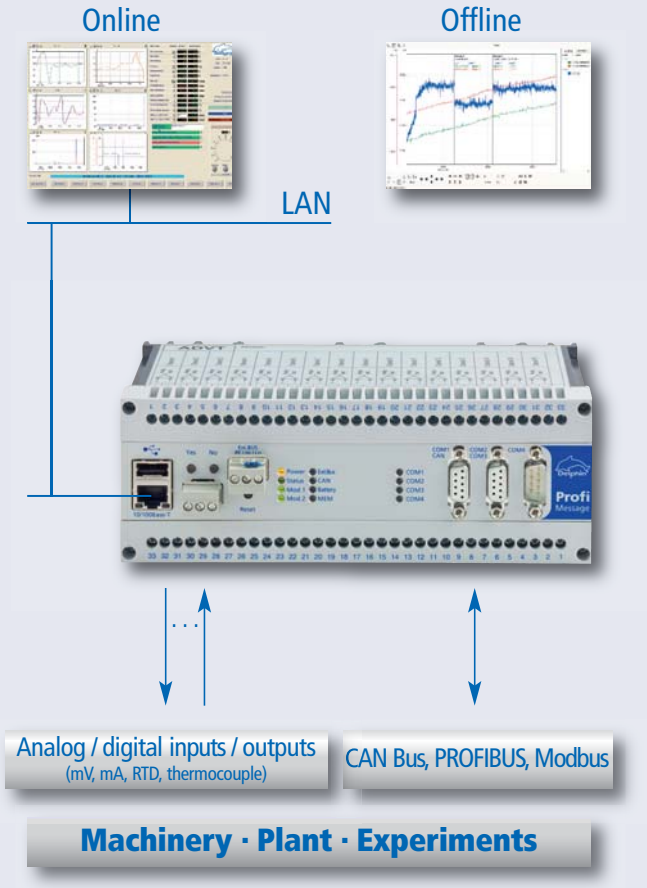
ProfiMessage is the modular system for data acquisition, monitoring and automation of machinery, plant and test stands. ProfiMessage uses master and slave devices and a range of I/O modules to enable it to be adapted to any application.

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

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

The compact devices measure and store data as stand-alone, independent systems. An internal 16 GB memory is able to record.

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



Applications

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

Technical specifications are available on page 47.

n and automation

Intelligent monitoring and analysis

In conjunction with vibration measurement I/O modules, the ProfiMessage becomes a shaft and bearing vibration measurement device. Devices are then typically deployed in monitoring and analysis systems for condition monitoring. By attaching modems or router, users can use ProfiMessages as independent remote monitoring systems for plant, marine vessels, vehicles or similar decentralized machinery.

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

Functions

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

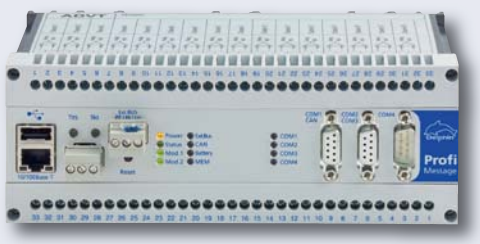
ProfiMessage and ProfiLab with identical functions.

ProfiLab – for the laboratory

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

ProfiMessage – for industry

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



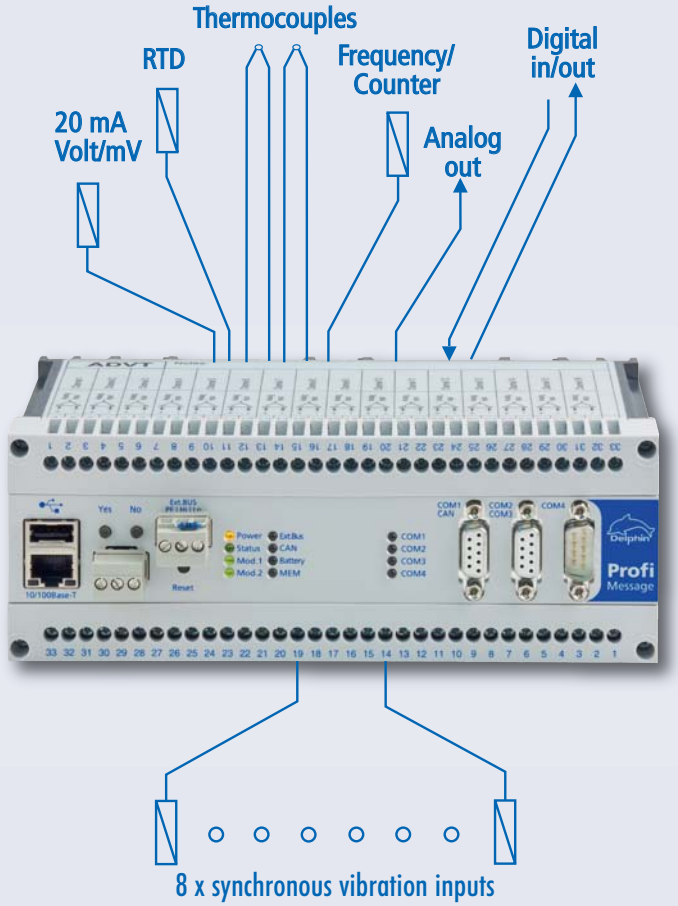
ProfiMessage – Functions

Universal and galvanically isolated

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

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

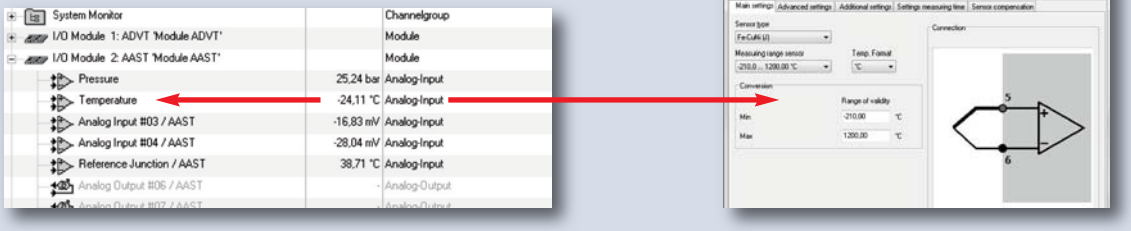
Earth loops and non-isolated sensors therefore present no problems. This unique system architecture enables problem free non-isolated measurement.



Simple and intuitive configuration

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

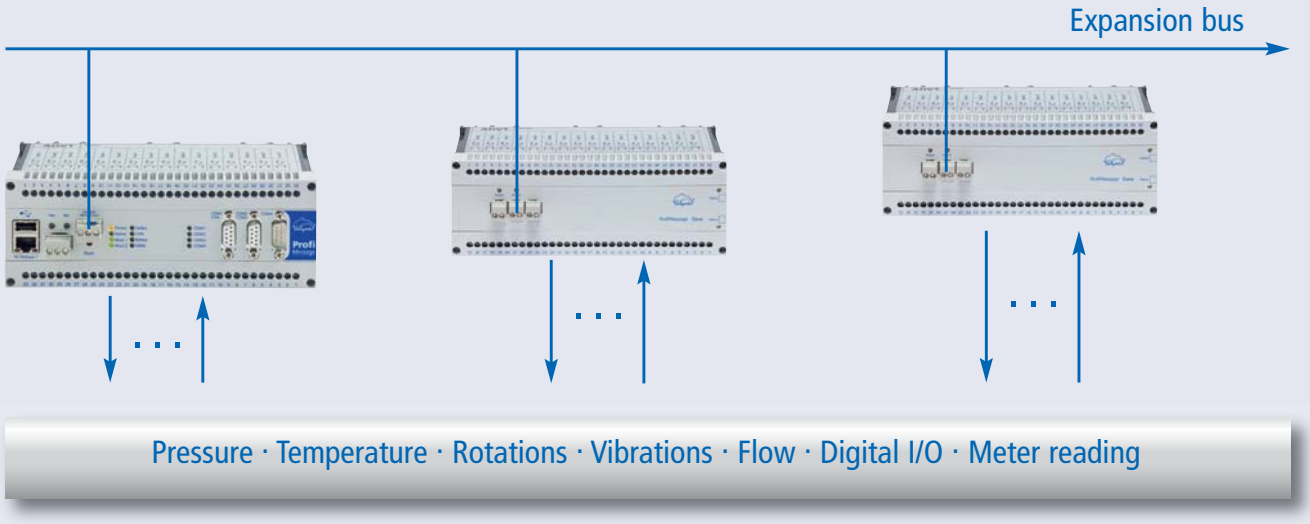
The individual configuration files are stored in XML format within the ProfiMessage devices and can therefore be accessed and updated offline using an XML editor.



I/O modules

Flexible and extendible

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



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

ProfiMessage – Interfaces

A range of interfaces

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

PROFIBUS

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

Modbus TCP / RTU

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

RS232 / RS485

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

CAN bus

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

LAN / TCP

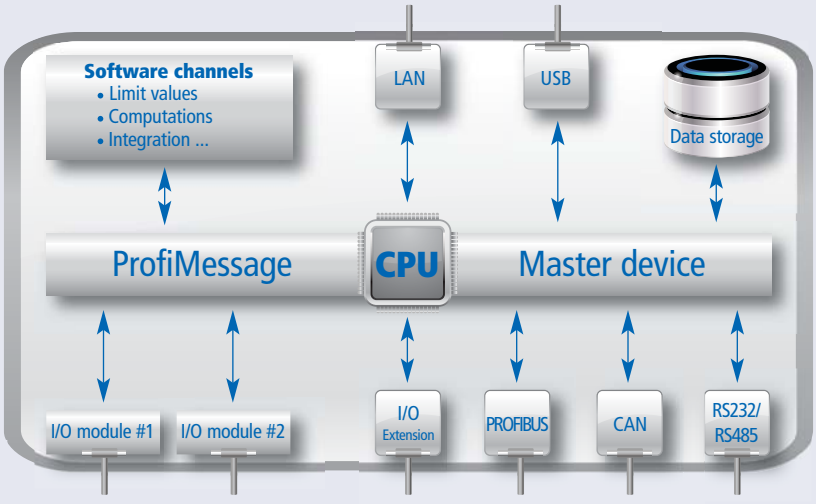
The LAN interface can be used to transmit all measurement data online, including software channels, at high speed via intranet or internet. Any networked PC can then access the ProfiMessage devices via this interface. There are also additional TCP services such as NTP, FTP, HTTP and SMTP etc. available.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

USB interface (Master)

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

Expansion bus

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



ProfiMessage interfaces and functions

Extended functions

Intelligent and secure

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

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

ProfiMessage – Technical specifications

	ProfiMessage / ProfiLab
Analog inputs	
Voltage range / Current range	± 156 mV ... ± 10 V / 0/4 ... 20 mA
Thermocouples	any, all types, integrated temperature compensation; resistance thermometer Pt100(0), NTC and linear resistance to 10 kΩ (not ADVT)
Potential isolation	750 VDC for system and supply; 400 VDC between channels at ADGT module 2.0; 650 VDC between channels at ADGT module 3.0; 110 VDC between channels in other modules
Resolution	24-bit (7 decimal places) precision: V, mA 0,01 % v. accumulated value Pt100:0,1 K; Pt1000: 0,05 K; thermocouple 0,1% from accumulated value
Analog outputs	
Resolution / potential isolation	16 Bit / 750 V
Output signal	0/4 ... 20 mA at maximum burden 650 Ω
Digital inputs	
Potential isolation	2,5 kV
Measurement range	low: 0 ... 1,5 VDC@0 ... 1,5 mA / high: 3,5 ... 90 VDC@2 mA
Frequency / counter inputs	
Potential isolation / 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 to TTL-level
Digital outputs	
Potential isolation	2,5 kV
Switching voltage	max. 50 VDC@2,5 A
Data storage	
Standard size / measurement data	Storage partitionable, standard: 500 MB; max. 250 million measurement values
Max. size / measurement data	16 GB; up to 1 billion measurement values
Serial interfaces	
Physical equipment COM 1 / COM 2	RS485, 9-pole sub-D connector, DIN EN ISO 19245-1
Physical equipment COM 3 / COM 4	RS232, 9-pole sub-D connector
Protocols COM 1 / COM 2	PROFIBUS DPV1 Slave (both interfaces), also redundant, according PNO 2.212 V1.2
Protocols COM 1 ... COM 4	Modbus RTU Master / Slave, custom specific protocols
Ethernet	RJ45 (8-pole STP-socket), 100 BaseT Protocols: TCP/IP, HTTP, SMTP, NTP, Modbus TCP Client / Server
USB	USB 1.1. for configuration and memory download
CAN	9-pole sub-D connector, protocols: CAN, RAW; Baudrate: 50 K … 1 MBaud
Module bus	
Physical equipment	3-pole Phoenix plugs; internal bus for connecting additional modules
Baud rate / length	1 MBaud (adjustable) / up to 10 m (1 MBaud)
General technical information	
ProfiMessage dimensions	200 x 73 x 118 mm
ProfiMessage weight	1 kg
ProfiMessage mounting	Rail mounting DIN EN 60715 or screw fixing
ProfiMessage signal connections	Deatchable screw terminals, 33 terminals (2-rows), lead protection, connector cable, max. 2,5 mm²
ProfiLab dimensions	226 x 145 x 180 mm
ProfiLab weight	1 kg
ProfiLab signal connections	up to 64 4 mm laboratory connectors, gold plated
Temperature range	-20 ... 60 °C
Power supply	12-36 VDC / 12-28 VAC eff. / ± 10%, at AMDT/ADFT min. 18 VAC/DC power input for master device: < 10 Watt