

# ProfiMessage

## NEW

**Modular. Secure. Adaptable.**



# ProfiMessage – Modular data acquisition

## Modular and secure

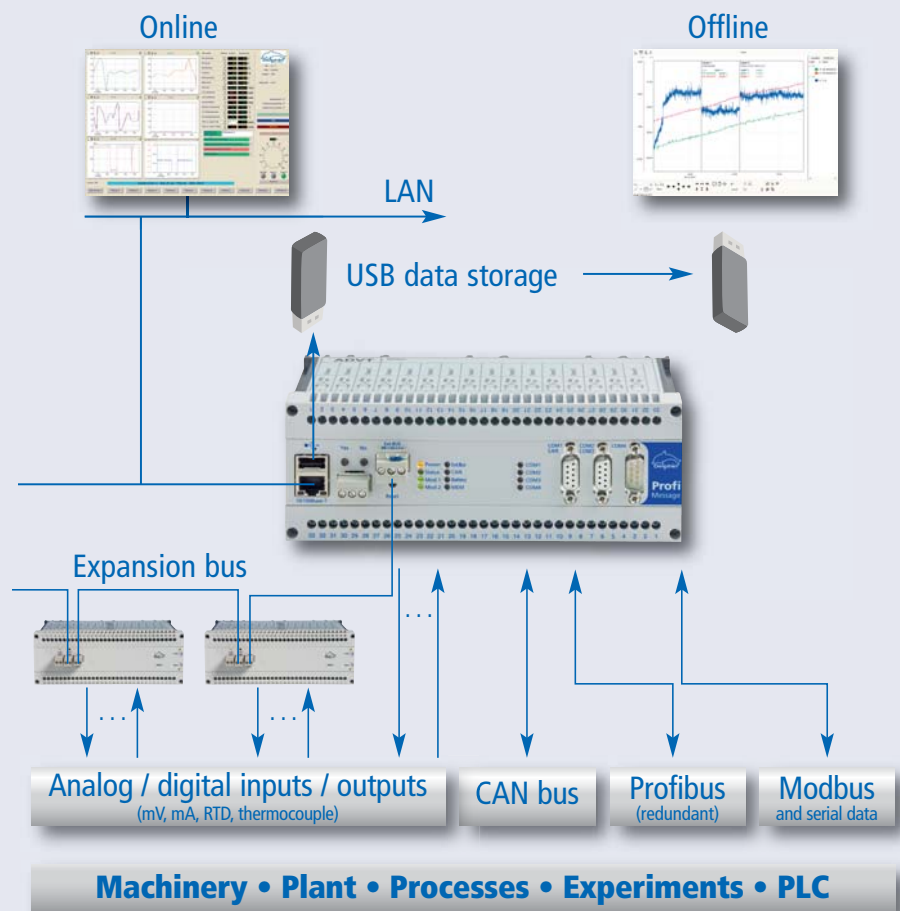
ProfiMessage is the new modular system for data acquisition, monitoring and automation of machinery, plant and test stands. ProfiMessage uses master and slave devices and a range of I/O modules to enable it to be adapted to any application.

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 devices measure and store data as stand-alone, independent systems. An internal 16 GB memory is able to record up to several billion measurement records. At the press of a but-

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



## 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

# 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, users can use ProfiMessages as fully independent remote monitoring systems for plant, marine vessels or similar decentralized machinery and vehicles.

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 record-keeping systems into the device without requiring any IT expertise. This system of software channels has been taken from the popular TopMessage series. 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



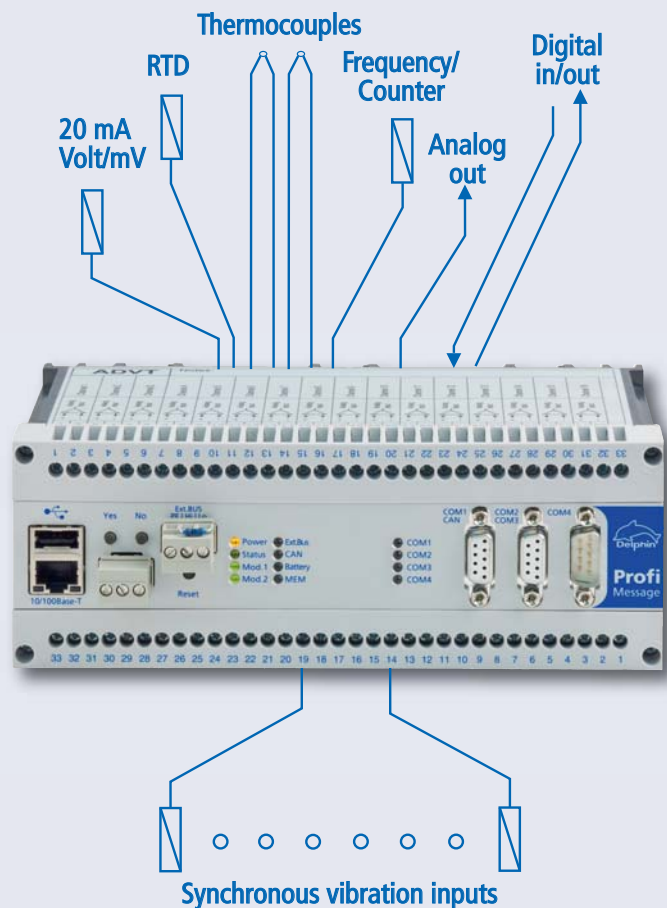
# Functions

## Universal and galvanically isolated

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 therefore prevents the occurrence of damaging earth loops and enables problem free non-isolated measurement.

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.

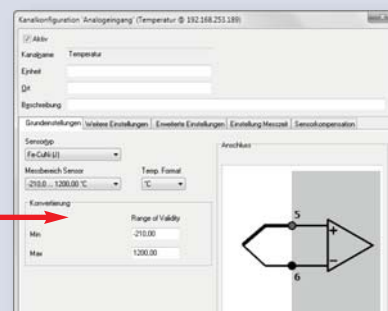


## Simple and intuitive configuration

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.

Druck	15,09 bar
Temperatur	25,81
Analog Input #03 / AAST	
Analog Input #04 / AAST	
Ref. Temperatur	37,78 °C
Analog Output #06 / AAST	
Analog Output #07 / AAST	
Analog Output #08 / AAST	
Analog Output #09 / AAST	

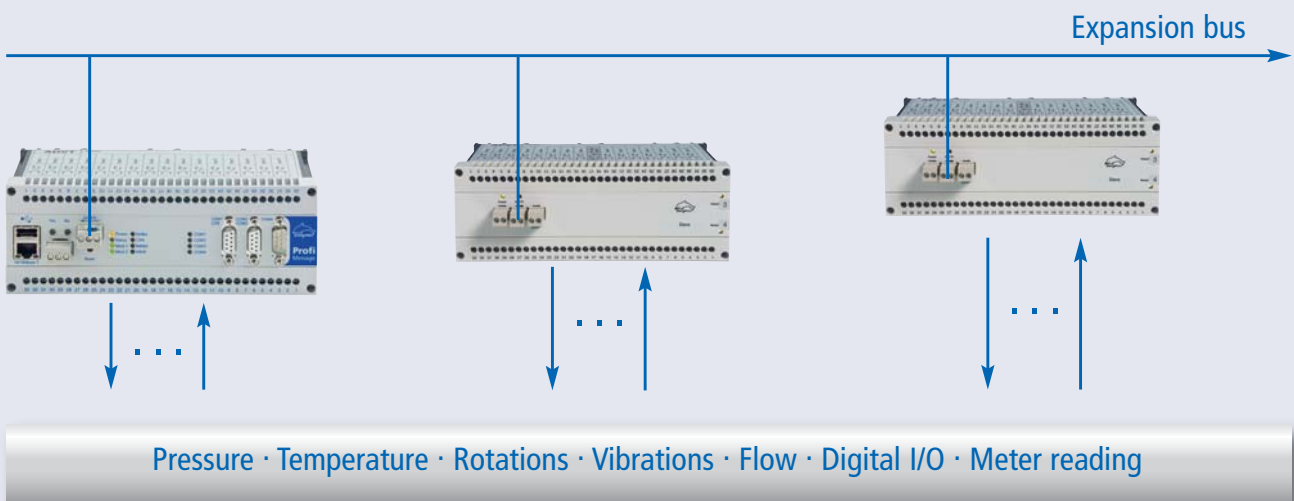


# I/O modules

## Flexible and extendible

ProfiMessage master/slave devices can be equipped with two either identical or different I/O modules. 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
<b>ADGT</b>	8 channels, V/mV, 20 mA, RTD, thermocouples					60 Hz
<b>ADIT</b>	10 channels, V/mV, 20 mA, RTD, thermocouples	1 channel 20 mA			1 channel	600 Hz
<b>ADVt</b>	15 channels, V/mV, 20 mA, thermocouples					600 Hz
<b>ADFT</b>	8 channels V/mV, 20 mA	2 channels 0 ... 10 V DC	2 channels	2 channels	4 channels	10 kHz
<b>AMDt</b>	8 Kanäle V/mV, 20 mA	2 channels 0 ... 10 V DC	2 channels	2 channels	4 channels	10 ... 160 kHz
<b>AASt</b>	4 channels, V/mV, 20 mA, RTD, thermocouples	4 channels 20 mA		2 channels	2 channels	600 Hz
<b>IOIT</b>				24 channels	1 channel	
<b>OTPT</b>				1 channel	24 channels	
<b>DIOT</b>			11 channels	1 channel	16 channels	



# Interfaces

## A range of interfaces

ProfiSignal 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 measure-

ment devices via RS232/485. An Ethernet high-speed connection is available for connecting ProfiMessage to a PC workstation or server. X-Message functions enable ProfiMessage devices to communicate online with each other, and to exchange data, without PC support.

## Profibus

ProfiMessage is optionally 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 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

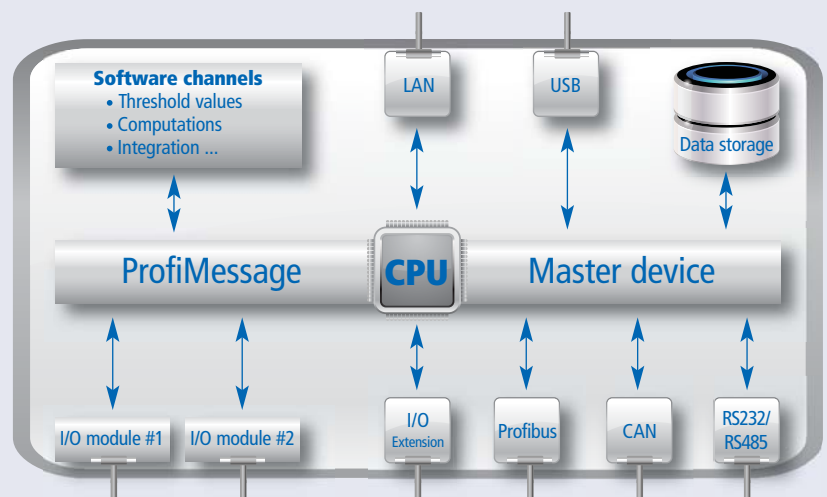
The LAN interface can be used to transmit all measurement data online, including software channels, at high speed via intranet or internet. Any networked PC can then access the ProfiMessage devices via this interface. There are also additional TCP services such as NTP, FTP, HTTP and SFPMP etc. available. 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 thermal switches
Monitoring		Description	Examples
	Wake-up	Generates impulses for absolute chronological events (once a day, week, month ...)	Determining daily statistics for production
	Batch alarm	Generates an alarm from multiple digital input channels	Alarms from various parts of an installation are summarized in one notification
	Threshold value	Generates an event for a threshold violation (over / under runs, consistency, hysteresis, line monitoring)	Alarm for overrun of a storage temperature
	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 rest, 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
	Variable	Records constants and parameters	Process constant

# ProfiMessage – Technical data

## ProfiMessage / ProfiLab

<b>Analog inputs</b>	
Voltage range	$\pm 156 \text{ mV} \dots \pm 10 \text{ V}$
Current range	$0/4 \dots 20 \text{ mA}$ (max. $500 \Omega$ shunt)
Thermocouples	Any, all types, integrated temperature compensation; resistance thermometer Pt100(0), NTC and linear resistance to $10 \text{ k}\Omega$ (not ADVT)
Resolution	24-bit ( $\approx 7$ decimal places) precision: V, mA 0,01 % v. accumulated value Pt100 0,1 K; Pt1000 0,01 K; thermocouple 0,1% from accumulated value
<b>Analog outputs</b>	
Resolution / potential isolation	16 bit / 750 V
Output signal	$0/4 \dots 20 \text{ mA}$
Maximum burden	$650 \Omega$
<b>Digital inputs</b>	
Potential isolation	2,5 kV low: 0 ... 1,5 VDC@0-1,5 mA high: 3,5 ... 90 VDC@2 mA
<b>Frequency / counter inputs</b>	
Potential isolation	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
<b>Digital outputs</b>	
Potential isolation	2,5 kV
Switching voltage / inverse diode	max. 50 VDC@2,5 A / integrated
<b>Data storage</b>	
Standard size / measurement data	Storage partitionable, data compression standard: 500 kB; max. 96,000 measurement values
Max. size / measurement data	16 GB; up to 1 billion measurement values
<b>Serial interfaces</b>	
<b>COM 1 / COM 2</b>	RS485 interface, switchable Profibus DP slave interface
Physical equipment	9-pol sub-D connector, galvanic isolation 1 kV
Baud rate	RS485: 500 KBaud; Profibus: 12 MBaud
Protocols	PC terminals, large displays, Modbus RTU, Master slave, TCP
<b>COM 3 / COM 4</b>	RS232 interface
Physical equipment	9-pol sub-D connector, galvanic isolation 1 kV
Baud rate	RS232: 57,6 KBaud
Protocols	PC terminals, large displays, Modbus RTU, Master slaves
<b>Module bus</b>	
Physical equipment	3-pole Phoenix plugs; internal bus for connecting additional modules
Baud rate / length	10 MBaud (adjustable) / up to 10 m (1 MBaud)
<b>General technical information</b>	
Dimensions / weight	ProfiMessage: 200 x 73 x 118 mm / ProfiLab 226 x 145 x 180 mm / each 1 kg
ProfiMessage-mounting	Rail mounting DIN EN 50023 or screw fixing
Signal connections	ProfiMessage: Deatchable screw terminals, 33 terminals (2-rows), lead protection, connector cable, max. 2,5 mm / ProfiLab: up to 64 4 mm laboratory connectors, gold plated
Temperature range	$-20 \dots 60 \text{ }^{\circ}\text{C}$
Power supply	12-36 VDC / 12-28 VACeff. / $\pm 10\%$ , bei AMDT 18 VAC/DC power input for master device: < 10 Watt
Ethernet interface	RJ45 (8-pol. STP-socket), 100 Base-T (twisted pair, 10 Mbps, full-duplex), galvanic isolation: 1,5 kV Protocol: TCP/IP, UDP, ICMP, Modbus TCP, Master slaves
USB interface	USB 1.1. configuration and download