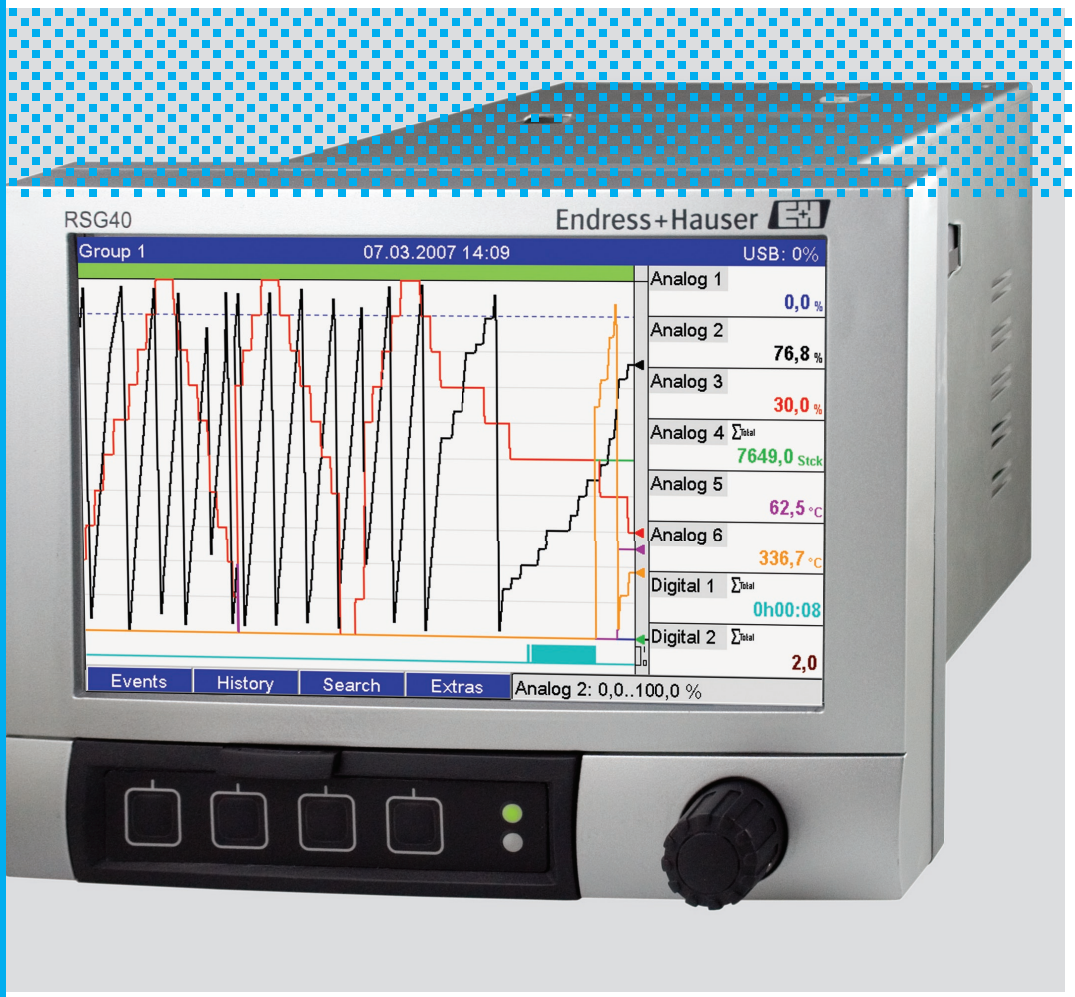
Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Memograph M
Graphic Data Manager



Store, visualize, analyze and communicate process values

- Generous basic features, flexibly expandable.
- Important information available at a glance due to the large 7“ (17 cm) display.
- Highest data security and FDA conform user administration.
- Simple data exchange using standard interfaces such as USB, Ethernet or OPC.

Endress+Hauser
People for Process Automation

Graphic Data Manager Memograph M –
The new generation in videographic recorders

As one of the world's largest industrial recorder manufacturers Endress+Hauser has been supplying strip chart recorders, data loggers and paperless recorders since 1980 – that is many years of valuable experience and more than 150,000 installations world wide!

As the success story of the Memograph recorder family shows, this equipment offers the greatest measure in reliability and flexibility. These recorders are applied in almost all areas of industry such as food & beverage, pharmaceuticals, environmental technology, power, pulp & paper, primaries, chemical and oil & gas.

State-of-the-art data recording

With the Graphic Data Manager Memograph M Endress+Hauser introduces its new videographic recorder. The innovative device is impressive because of its high functionality, modular construction and its intuitive operator concept.
The ideal fields of application for Memograph M are in the process measurement in the water/waste water, power and the food as well as pharmaceutical industries. The functionality, flexibility, secure data recording, the informative measurement evaluation and brilliant measurement display means that the applications are limitless. As a standalone system or as an efficient system component Memograph M is the ideal solution for every task.
The device is easy to operate and offers a multitude of possibilities to save costs and simplify data storage.

Advantages of Memograph M

- Brilliant: 7" TFT display as a front end display for optimum readability.
- Fast: 100 msec scan rate for all channels, high speed memory cycle of 100 msec.
- Secure: Security package with user defined access rights and electronic signature (FDA 21 CFR 11).
- Modular: Simple expansion to 20 universal- and 14 digital inputs or 12 relays.
- Flexible: Selectable display mode. Brand-new: analog instrument display and circular chart display.
- Limitless: Integrated Web-server, fieldbus (PROFIBUS, Modbus), standard protocols and interfaces such as USB, TCP/IP, OPC, Ethernet are supported.
- Informative: Event search, automatic signal evaluation
- Practical: 158 mm installation depth, IP65, NEMA4 plastic front bezel.
- Concise: Alarm management with all active, acknowledged and historical alarms.
- Re-calibration of a measurement chain can be done in an installed system.

Memograph M is the "Window to the process"!

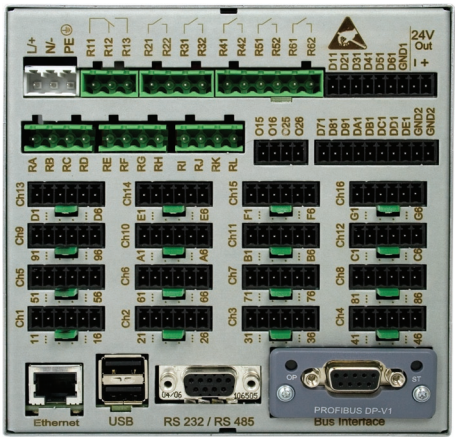
- Selectable, easily understandable screen display mode.
- Front end trend value monitoring without complex PLC/SCADA software.
- Independent data recording system guarantees manipulation protected data recording for the most demanding tasks.
- Off-line data evaluation and reports in standard paper-size printouts for process and cost optimization.
- No programming, only set-up.
- Simple process traceability.
- Compliance with quality parameters can proven at any time.

Functions and design

Generous basic features, flexibly expandable
As the only device on the market in this class Memograph M can internally record up to 20 universal inputs, analyze the raw data and store analog values, counter values or quantities and simultaneously up to 6 different operating times or switching states. By using PROFIBUS or Modbus the device can be extended to 40 channels and be connected to SCADA and PLC systems. The processing of arbitrary nonlinear signals is no longer a problem, because a 32 point linearization table can be defined for each individual input. 2 analog outputs provide additional flexibility.

Loop power supply
A sensor power supply (200 mA, 24 V) makes direct connection of a loop powered or 4-wire sensor possible. This saves time and costs, and simplifies the wiring requirement.

Front-end operation of the device
Operation of the device is dialog-based via menus, using a navigator (jog-shuttle) in combination with 4 pushbuttons Alternatively Memograph M can be operated using an external keyboard (USB). Another highlight is the integrated on-line help which almost makes the published user manual superfluous.



Important information at a glance due to the large 7“ display
The process values and event messages are shown on the high definition 7” TFT display and can therefore be easily read from a large distance thus making direct access on the spot for current and historical production data possible for the user. The large screen represents a number of different display formats such as curves, bar graph, but also circular chart and analog instrument display. Depending on the requirements, mixtures of these can also be set up by the user. Active channels can be assigned into 10 groups. For clear identification these groups can be assigned individual names e.g. “temperature boiler 1” or “daily average values for all boilers”.

Operation using PC-Software
Set-up and operation of the device is also possible via the ReadWin® 2000 PC software.
Set-up and communication is done using:
- USB interface
- Ethernet
- Serial interface
- SD-memory card

Set-up data can also be stored on an SD-card or USB-stick and printed out for archiving purposes. Device set-up can be transmitted to the device directly from a memory card.

Text input
Notes and comments can be allocated to the recorded signals and subsequently saved.

Operation language
The operating language (e.g. German, English, French, Italian) can be easily changed directly at the device even during operation.

Compact and robust
The required installation depth amounts to only 158 mm, thus narrow control panels can be used. This reduces costs and materials, especially for new installations. The robust front bezel plastic materials ensures the IP65, NEMA4 protection class.

Graphic Data Manager Memograph M
High security standard

By fulfilling the requirements laid down in the 21 CFR Part 11, electronic recording and signatures are given an identical legal status as traditional documentation and hand written signatures. All the old problems with the time consuming traditional recording (paper jam, paper and pen change) are a thing of the past – electronic evidence is the new direction!

The following functions guarantee compliance with the FDA 21 Part 11 and, therefore, the traceability of all process sequences:

- Integrated user and rights management.
- ID + password = electronic signature.
- Mechanisms that request the user to change his password regularly.
- More than 50 users with various access levels and rights can be entered.
- Access protection.
- Access block on entry of 3 invalid login attempts.

All operation steps and messages generated by the unit, e.g.
- Login/-out
- Set-up changes
- Alarm set point violations
- Recalibration
- Text entry/comments
- Events and power failures

These are placed and stored in the Audit Trail and time stamped with allocation to the respective responsible user (in both the unit and the ReadWin® 2000 PC software).

Data security

The Graphic data manager completely archives process curves and events. Stored data is not lost, not even during a power down.

Details at a glance:

- Large internal memory capacity of 256 MB.
- The internal memory operates as a ring memory according to the FIFO principle (first in – first out).
- Optimal storage utilization by data compression.
- Additional storage on external industrial grade SD cards (can be used as a ring or stack memory) or USB memory stick.
- Minimum, maximum and average values as well as envelope values, quantities and events are stored in predetermined memory time cycles.

SD-card in industrial standard

- High data integrity and failure security.
- Low intrinsic heating.
- 2 million write/delete cycles per block.
- High reliability (MTBF > 3 million hours).

Data transmission to PC via ReadWin® 2000 software

The recorded values are only stored in the PC database after a fault-free transmission. Any possible manipulation of the data is recognized and subsequently highlighted. The data can of course also be exported to other programs (e.g. MS®-Excel) without changing the original protected data.

Intelligent alarm- and limit management

Reliable and punctual recognition of limit value violations safeguards high quality and reduces costs.

Memograph M supervises analog values and counters.

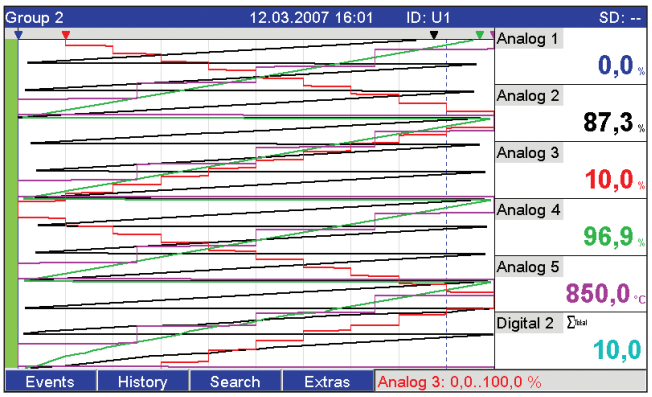
Flexible possibilities to save on external components and time consuming wiring:

- 100 alarm limit set points can be allocated to the channels.
- Pre-alarm and main alarms can be selected.
- Adjustable hysteresis.
- Short-time peaks can be ignored.
- Device-internal switched outputs (up to 12 relays) can be freely allocated. These can be allocated to individual alarm annunciators (e.g. siren, lamp.) Alternatively, valves or pumps can also be controlled. This saves additional equipment for the alarm annunciator or sequence control.
- Freely adjustable event report texts.
- Acknowledgeable alarm violations make sure that the violation is recognized.
- Displaying the limit value as a channel-related colored line on the display.

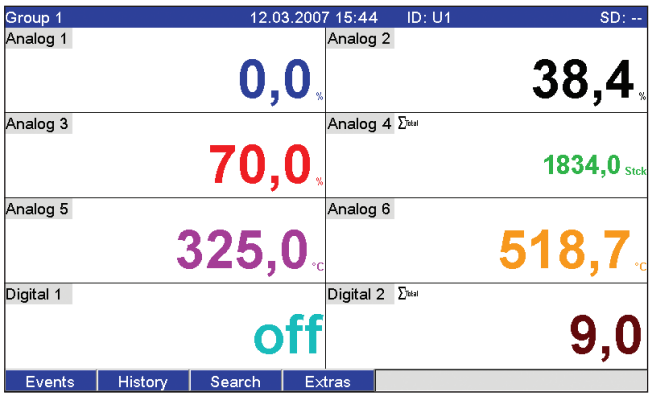
Flexible display mode selection
Visualization

For different types of data different graphic displays are often required. Are only the analog values to be displayed or should these be combined with digital signals?

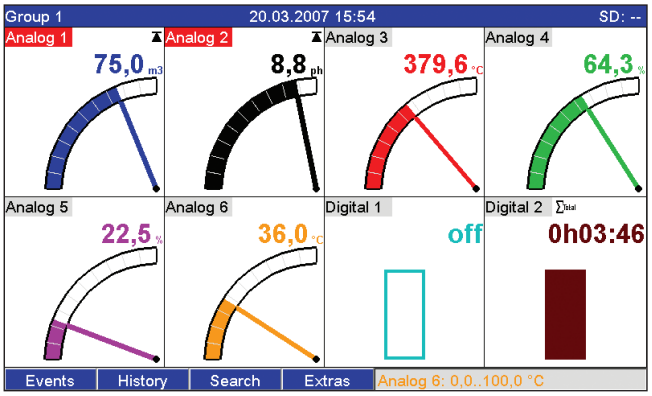
Memograph M leaves the choice to the operator at the touch of a button. Up to 10 groups each with a mix of maximum 8 channels can be displayed.



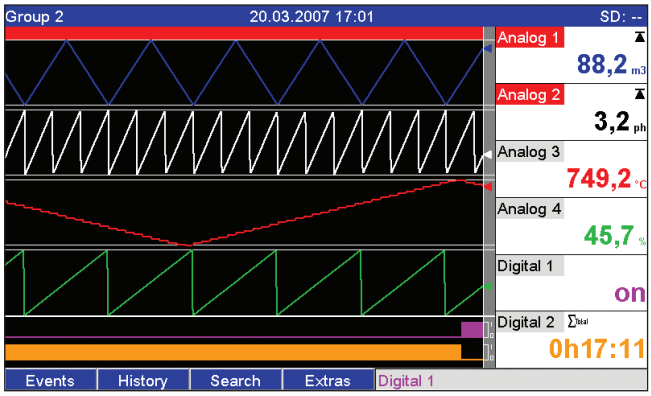
Waterfall display



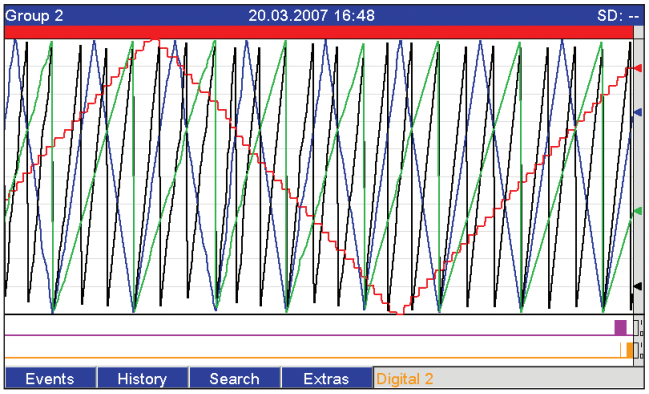
Digital display



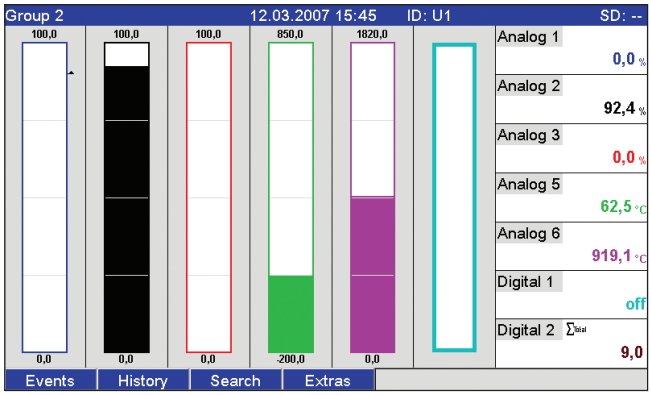
Analog instrument display



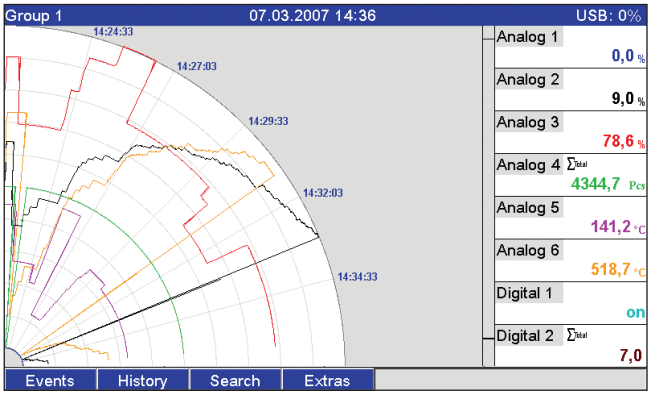
Curve display selectable with black background



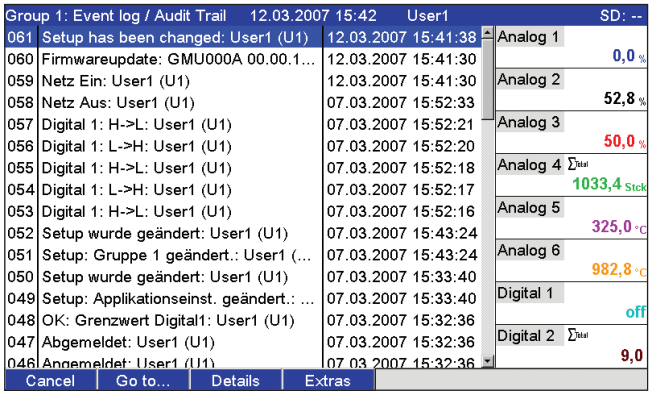
Curve display in full screen version



Bargraph



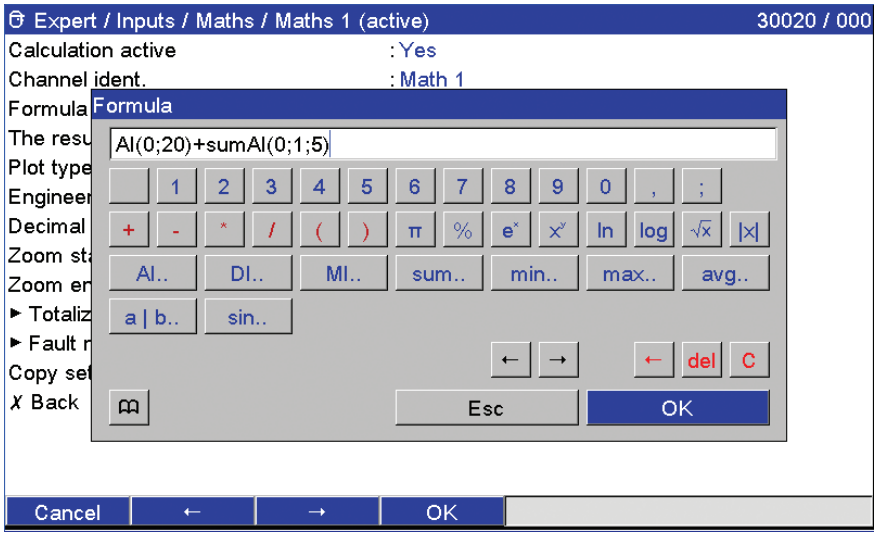
Circular chart display



Event log book

Intelligent videographic recorder Memograph M
Calculate and solve tasks

Mathematics and logic
With the optional mathematics package eight additional channels are available. Individual channels can be combined with each other and then calculated using various mathematic functions. The calculated mathematics channels are treated like "real" channels irrespective of whether they are or connected conventionally or via a fieldbus.
The formula can be an arbitrary combination of arithmetic calculations and logical operations. Analog, digital or also mathematics channels already active can be used.



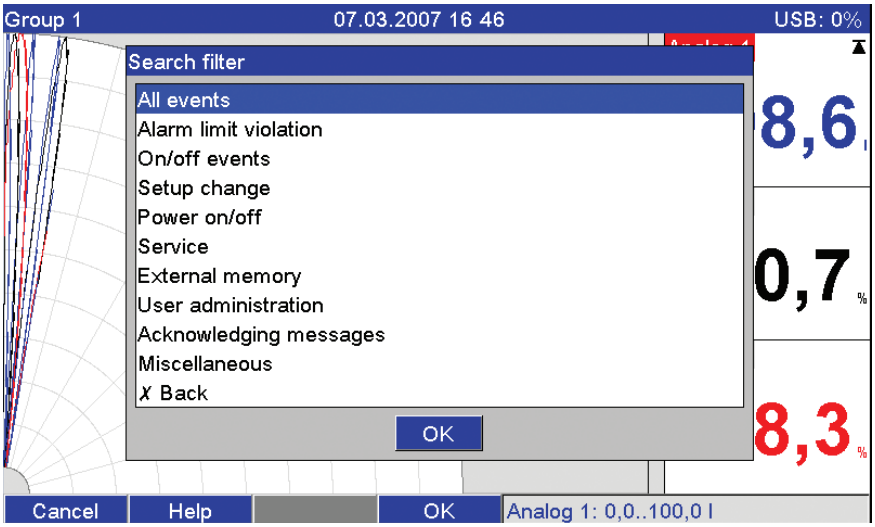
Save both time and money with these functions:
- Basic arithmetical operations combine analog measurements.
- Trigonometrical as well as absolute value, root and square functions.
- F0 calculations (e.g. in sterilization processes).
- Factors and constants complete the calculation functions.
- Channels calculated mathematically can be combined/cascaded.
- Square root extraction linearizes squared signals.

Linearization
Up to 32 linearization points for all active analog inputs can be entered directly or by means of the PC software ReadWin® 2000.

Integration (totalizer)
By using the integration (totalizer) function the quantity can be calculated (in m^3) from an analog signal (e.g. flow in m^3/h). This can then be displayed as day, week, month, year and total values.

Search function: Answers to all questions
The search for certain information was to this day a very time and cost consuming task. In the future leave this up to the Memogaph M Graphic Data Manager!
It will answer all questions asked:
- When did the temperature rise above 80 °C?
- What happened yesterday at 12:00 o'clock?
- When was the filling stopped?
- How long was the plant down?
- When/how long did the pumps run?
- How have the signals developed over a longer time period?

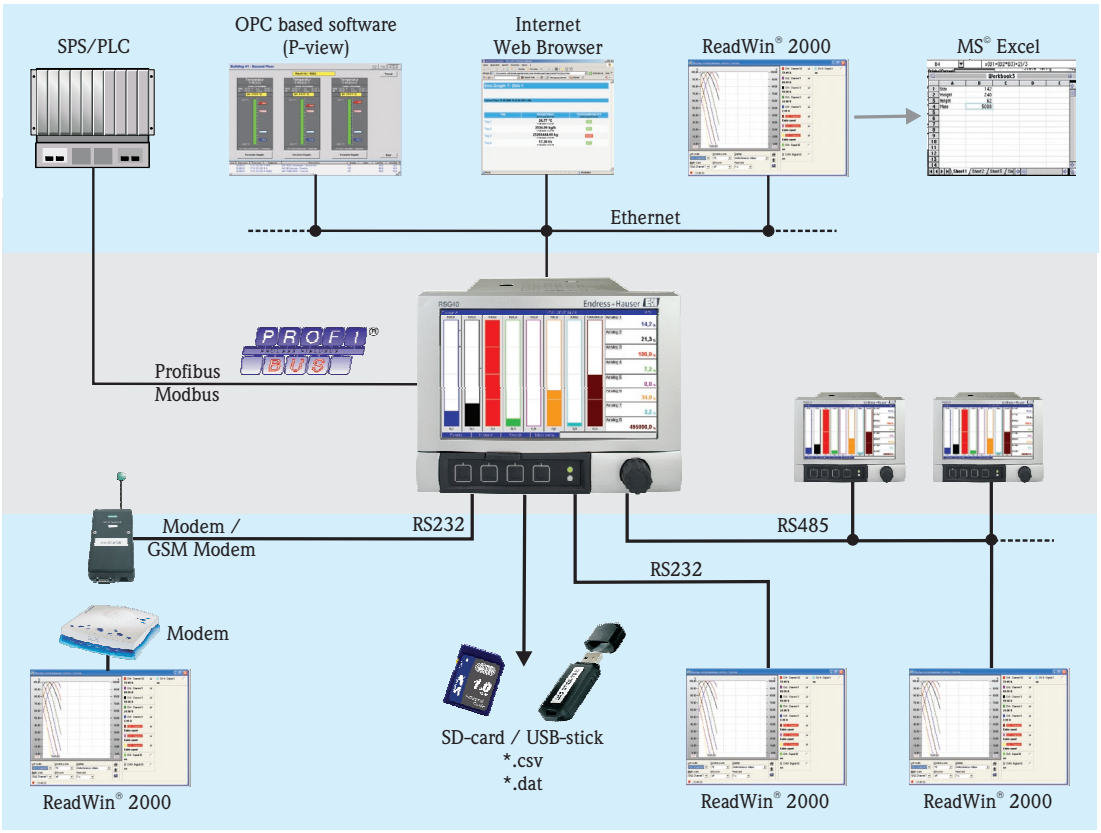
Automatic signal analysis
The Memograph M automatic signal analysis provides easily read conditions. Actual and previous signal quantities and peaks are listed in tables. This gives a fast overview of, for example, the last shift, the actual day, the last month etc.
- Automatically calculates averages, minimum and maximum values for the analog measurement points.
- Calculates intermediate, daily, monthly, yearly reports.
- Shows counter values, operating times and quantities.



System integration and communication

All units are equipped with a number of different communication possibilities. Interfaces connect these to PC, modem or PLC and will also connect them to bus systems. The units can then be remote-controlled and the measured values read out.

Whether as a stand-alone solution or a part of an existing system the units operate individually or as redundant monitoring and recording systems. This means that they increase security and avoid process downtime even during network breakdowns.



USB interface
In the standard version the device has two front mounted USB interface ports. The interfaces can be used differently. The USB host interface serves for data transmission to a USB-stick. The USB function interface serves for the direct connection with a PC/laptop computer. Using this interface the stored data and device configuration can be accessed.

RS232/RS485
The serial interfaces serve for the connection of either a modem (RS232) for remote monitoring of the device or for the communication with a PC/laptop computer. By using the RS485 interface, a simple serial network can be built up (max. 32 devices).

Ethernet connection
Using this interface, paperless recorders can be connected to the local area network (LAN). By using the TCP/IP protocol, the measured data from the connected units can be accessed via any Internet/Intranet compatible PC or laptop computer and the delivered ReadWin® 2000 PC software. Stored data can be visualized and, with the help of the PC software, transmitted to the network compatible database. The IP address is set up directly in the unit or automatically from a DHCP server.

Remote monitoring/modem use
All functions available via serial link can of course also be used with modem connection. The videographic recorder can therefore be monitored worldwide.

Integrated web server
Standard web browsers like MS® Internet Explorer™ permit the simple access to instantaneous measured values.

Simple process data exchange using the OPC Server
OPC – OLE for process control is the industrial standard for exchanging process data on MS® Windows™ based computers. The advantage: With the Endress+Hauser OPC server it is possible to integrate process data from the units into most standard visualization or process control systems.

Modbus Slave RTU / TCP (Option)
By using the internally available Modbus interface, a total of 40 external analog inputs and 14 digital inputs can be recorded and stored by Memograph M. Via this interface, Memograph M can be connected to a master PC or a PLC control system.

Typical application areas

- An electronic data storage makes the traceability of the processes economical and the quality assurance possible, e.g. in the production of metals, plastics, ceramics, tires, cables, electronics etc..
- Overview of critical parameters during production, packing and cold storage of food, drinks and dairy products.
- Supervision and recording of consumption rates, filling levels and overflows in tank systems.
- Supervision of dangerous emissions of liquids, waste and gasses used in the production and petrochemical processing plants.
- Remote monitoring of deep wells, mineral water sources and pumping stations.
- Storage and invoicing of energy, gas and liquid consumption in industry.
- Storage and supervision of the performance characteristics of turbines, boilers and reactors in power stations.
- Supervision of critical parameters in drinking water filtration systems and rivers.
- Supervision of the chemical and biological load in the sewage of industrial plants and municipalities.
- Data acquisition in OEM versions for independent machine plants, such as filling machines, milk collecting stations, wine sterilization plants, milk pasteurization and cheese production.
- Multi-channel gateway between Intranet/Internet/visualization software and the sensors in the process, with or without redundant data recording.

Conclusion: Wherever process parameters have to be recorded and analyzed, visualized, supervised, the new
Memograph M is the answer!

Housing versions

Panel mounted device
Memograph M with IP65, NEMA4 plastic front bezel for panel installation.

Desk top housing
Portable version for laboratory and service use.

Field housing
Memograph M in a field housing (IP65), for wall mounted applications.

Further documentation:
- Recorder brochure FA014R/09/en
- Graphic Data Manager Memograph M, technical information TI133R/09/en

12.06/I.I.

Instruments International

Endress+Hauser
Instruments International AG
Kaegenstrasse 2
4153 Reinach
Switzerland
Tel. +41 61 715 81 00
Fax +41 61 715 25 00
http://www.endress.com
info@ii.endress.com

IN005R/09/en/03.07
71041159
RD/INDD CS2

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