System products and data managers

Solutions for the loop

Endress+Hauser

People for Process Automation

Endress+Hauser – Your partner

Endress+Hauser is a global leader in measurement instrumentation, services and solutions for industrial process engineering

With dedicated sales centers and a strong network of partners, Endress+Hauser guarantees competent worldwide support. Our production centers in twelve countries meet your needs and requirements quickly and effectively. The Group is managed and coordinated by a holding company in Reinach, Switzerland. As a successful family-owned business, Endress+Hauser is set to remain independent and self-reliant.

Endress+Hauser provides sensors, instruments, systems and services for level, flow, pressure and temperature measurement as well as analytics and data acquisition. The company supports you with automation engineering, logistics and IT services and solutions. Our products set standards in quality and technology.

We work closely with the chemical, petrochemical, food and beverage, oil and gas, water and wastewater, power and energy, life science, primary and metal, renewable energy, pulp and paper and shipbuilding industries.
Endress+Hauser helps customers to optimize their processes in terms of reliability, safety, economic efficiency and environmental impact.

E-direct - Purchase preconfigured basic field instruments or system components easily.
www.e-direct.endress.com

To learn more about Endress+Hauser, visit:
www.endress.com

Competence center for temperature measurement, temperature engineered solutions and system products

Endress+Hauser Temperature+System Products is one of the leading producers of temperature measurement, temperature engineered solutions and system products worldwide. The company employs more than 630 associates worldwide. 360 of which are working in our headquarters Nesselwang (Germany), where our products are developed and produced. Associated Product Centers in Pessano (Italy), Greenwood (USA), Suzhou (China) and Aurangabad (India) guarantee customer proximity with products and services.

Complete solutions with system products

Table of contents

Everything you need from a single source

Nowadays measuring technology is required to do far more than simply record the measured value and system products are needed to complete the measuring point. The measuring devices must be powered and protected, the measured value displayed or further processed, limit values must be derived and monitored and data must be recorded securely. Endress+Hauser components and data manager are more than capable to carry out these tasks.
These system products not only carry out the basic functionality; they increase your plant availability based on predictive maintenance information, they optimize your process by controlling directly at field level and use sophisticated calculation methods to measure energy consumption. It does not matter in which country or sector the solution is required, Endress+Hauser's system products will always provide the right component with the required functionality and approvals (e.g. SIL or intrinsic safety as per ATEX, FM, CSA, TIIS or NEPSI).

Fast and innovative

Easy installation and fast commissioning are top priorities for both the simple devices such as active barriers and multifunctional devices such as the Memograph M. A simple configuration is all that is needed to adapt the various functions to the application requirements. Furthermore a wide range of possible combinations are available thanks to various fieldbuses and interfaces as well as extensive software concepts such as the Field Data Manager software. This saves time and money in practice.

Fuel for thought

With vast experience in the oil & gas sector, we help you to perform, comply and thrive

From exploration to refinery, from storage to distribution, from plant upgrades to new projects, we have the application expertise to help you succeed.
At a time when the sector faces skills shortages and regulations tightening, our organization is here across the full life cycle of your project always with your deadlines in mind.
While complexity of facilities and processes are ever increasing, and downtime must be reduced, your competitiveness is enhanced with reliable, accurate and traceable asset information.

In short, you need to do more with less, benefiting from a stable partner who is here for the long haul and ready across the globe, offering:

- Assured plant safety
- Optimized return on investment
- Best-fit products, solutions and services

Advantages at a glance

- Mitigating risks by using state of the art technology meeting highest demands with regard to Functional Safety (IEC 61508) integrity
- Minimizing operational costs through efficient proof testing concepts, predictive maintenance and innovative data management
- Increasing plant availability with innovative technologies particularly designed for oil and gas industry applications

Product highlights

Memograph M RSG45

Advanced data manager for reliable data storage and visualization

- Unrestricted data exchange between field and control level
- Up to 20 universal (U, I, TC, RTD) or HART® inputs and up to 14 digital inputs
- Easy and fast commissioning using jog/ shuttle dial and buttons or via web server
- Ethernet-based fieldbuses guarantee flexible integration
- Software packages such as mathematics, tele-alarm and energy (water + steam)

RIA14 and RIA16

Loop powered field display unit ensures a better process overview on site

- Stainless steel housing (optional) for use in harsh ambient conditions
- Easily readable analog process values exactly where they are needed
- No additional power supply required
- Can be used in hazardous areas thanks to optional Ex d approval

HAW562 and HAW569

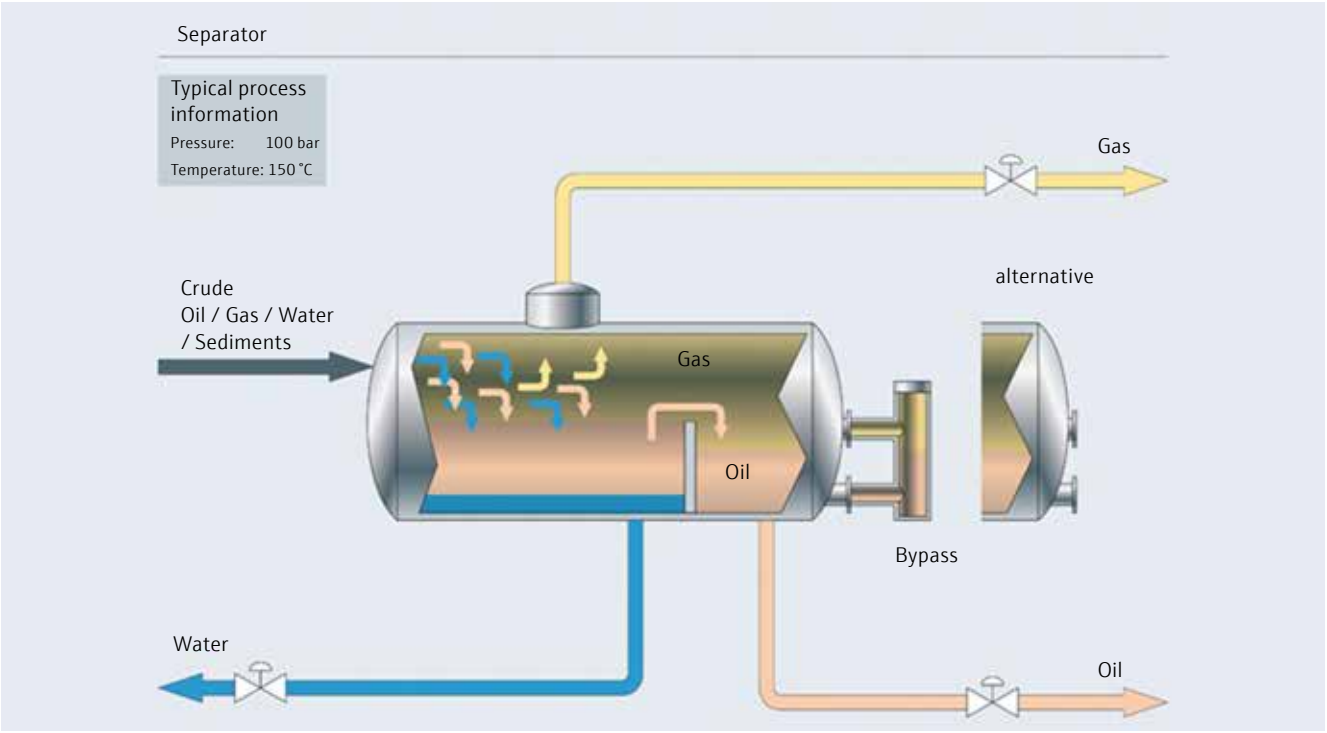
Customized overvoltage protection for top-hat rail or installation in the field

- Expensive sensors and devices are safely protected against overvoltages
- Can be used in a variety of applications thanks to Ex approvals, SIL 2-compliance and compatibility with established communication signals and fieldbuses

RID14 and RID16

Fieldbus display unit to show up to 8 FOUNDATION fieldbus values

- Easy commissioning thanks to listener mode
- Various housing shapes and materials mean that the devices can be used in the most diverse applications
- Global Ex approvals including Ex d



Global chemicals, competitive and safe

Get the extra project skill and know-how you need to boost your plant‘s safe performance

You gain concrete benefits from a partner who has first-hand knowledge of your sector‘s issues around the globe: on increased safety, on environmental protection, on over-supply leading to cost pressure and on finding engineering support and service when required. You can rely on our help to become more competitive in your line of business.

With a long history of industry firsts we have grown with the sector by listening, acting and innovating to better serve you with:

- Safety, built in
- The technology to lead
- Best-fit project management

Advantages at a glance

- Meeting internationally recognized standards/ recommendations as NAMUR and WHG
- Internationally accepted hazardous area approvals: ATEX, IECEx, FM/CSA, NEPSI, TIIS
- Use of state of the art technology – functional safety according to IEC 61508
- Uniform operating safety by design concepts for simple and safe operations
- Optimized material availability and minimized stocks through inventory management solutions

Product highlights

Ecograph T RSG35

Universal data manager with up to 12 universal inputs

- Secure data archiving in internal memory and additionally on SD card
- Common interfaces to make it system-compatible
- E-mail notifications in the event of limit value violations, faults and alarms

RIA15

Loop powered display unit in the field or panel-mounted housing

- Better insight into the process through visualization of the 4 to 20 mA signal or all of the 4 HART® values of a sensor
- Compact design means the device fits in any application yet still offers excellent readability
- Suitable for functional safety applications due to SIL interference freeness

RMA42

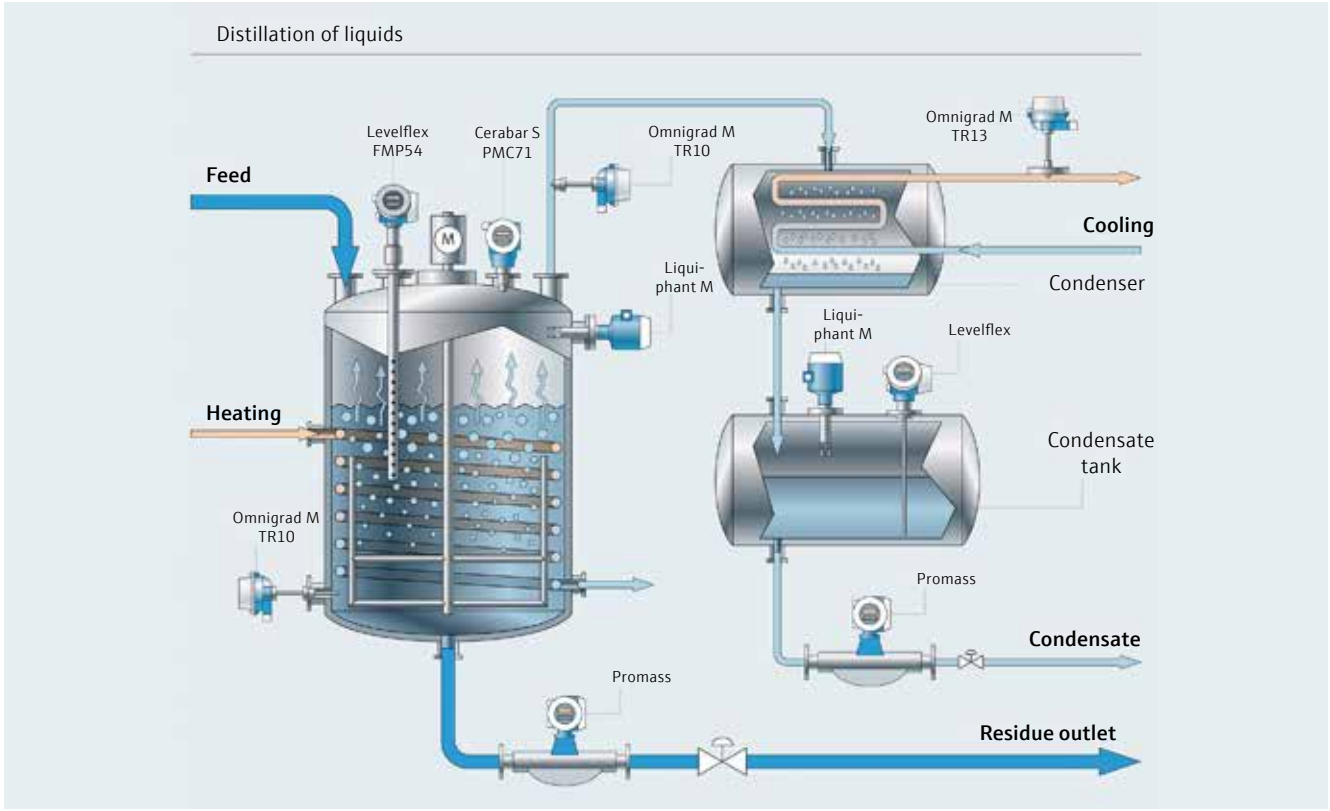
Process transmitter with control unit

- Processes and transfers up to 2 analog measuring signals
- 2 mathematics channels to calculate the sum, difference, multiplication, mean value and linearization via a maximum of 32 support points
- Limit value monitoring with the help of 2 relays

RN221N

Active barrier for safe separation of 4 to 20 mA standard signal circuits

- Suitable for numerous applications thanks to multi-voltage power supply unit, global Ex approvals and SIL 2
- Front-panel HART® communication jacks and integrated 250 Ohm resistor
- Optionally available with HART® diagnostics to monitor the HART® status byte of the connected sensor



Extracting more from less

In a world of lower grades, skills gaps and excavation challenges – we can help you hit your targets

We've seen how lower grades are driving an acute need for ever-better automation and controls. You are also facing emerging skills gap, requiring better-informed industry partners. At the same time, energy costs are only going one way, and the legislative environment is becoming increasingly stringent.

Tough challenges call for experienced heads who can:
- Reduce your metal and mineral production costs
- Keep your plant safe
- Boost compliance and responsibility

Advantages at a glance

- Complete product basket for all applications, specifically in harsh environments
- Advanced diagnostic functionalities to make the process more safe and reliable
- Savings in raw material, water, energy and labor through accurate data of critical and quality relevant points in your process

Product highlights

RMC621

Flow and energy computer for applications with gas, liquids, steam and water

- Up to three full applications in one device
- Calculations based on international standards such as NX19, SGERG(88), IAPWS-IF97, API 2540

RN221N

Active barrier for safe separation of 4 to 20 mA standard signal circuits

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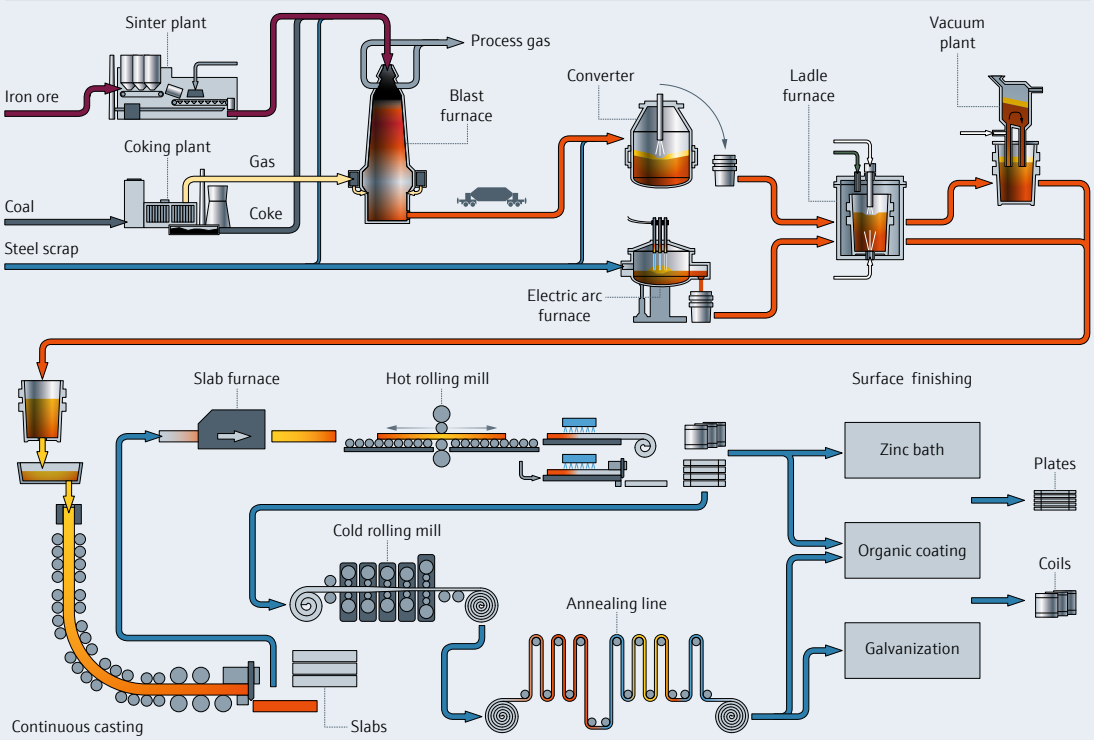
RIA45 and RIA46

Display with control unit for panel-mounting or in the field

- Combination of several functions in one device: active barrier, transmitter, control unit with relay
- Can be used in diverse applications thanks to limit value monitoring, easy calculations and linearization
- Easy-to-read, multi-colored display with color change in the event of an error

Metal integrated steel works plant



Nourishing your productivity

Your global partner for accurate measurements and expert support in food and beverages automation

From hygiene regulations and food safety to the basic demands of reliability and uptime, high quality food & beverage producers profit from our experience in more than 100 countries.

Get it right first time. With the help of an expert partner, you will make a safe choice and benefit from:

- Constant food quality & compliance
- Resources savings
- High level of plant availability

Advantages at a glance

- Food safety and reliability due to instruments designed and manufactured specifically for all requirements in food & beverage industry
- Accurate measurement and calculations guarantee savings of raw material, water, energy and labor costs
- Optimized material availability and minimized stocks through inventory management solutions

Product highlights

Memograph M RSG45

Advanced data manager for reliable data storage and visualization

- Easy data exchange between field level and control level
- Up to 20 universal (U, I, TC, RTD) or HART® inputs and up to 14 digital inputs
- Stainless steel front for quick cleaning and protects against contamination
- Application packages to adapt to process requirements perfectly
- FDA 21 CFR11-compliant data recording and user administration

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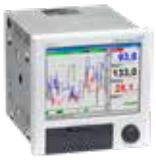
Ecograph T RSG35



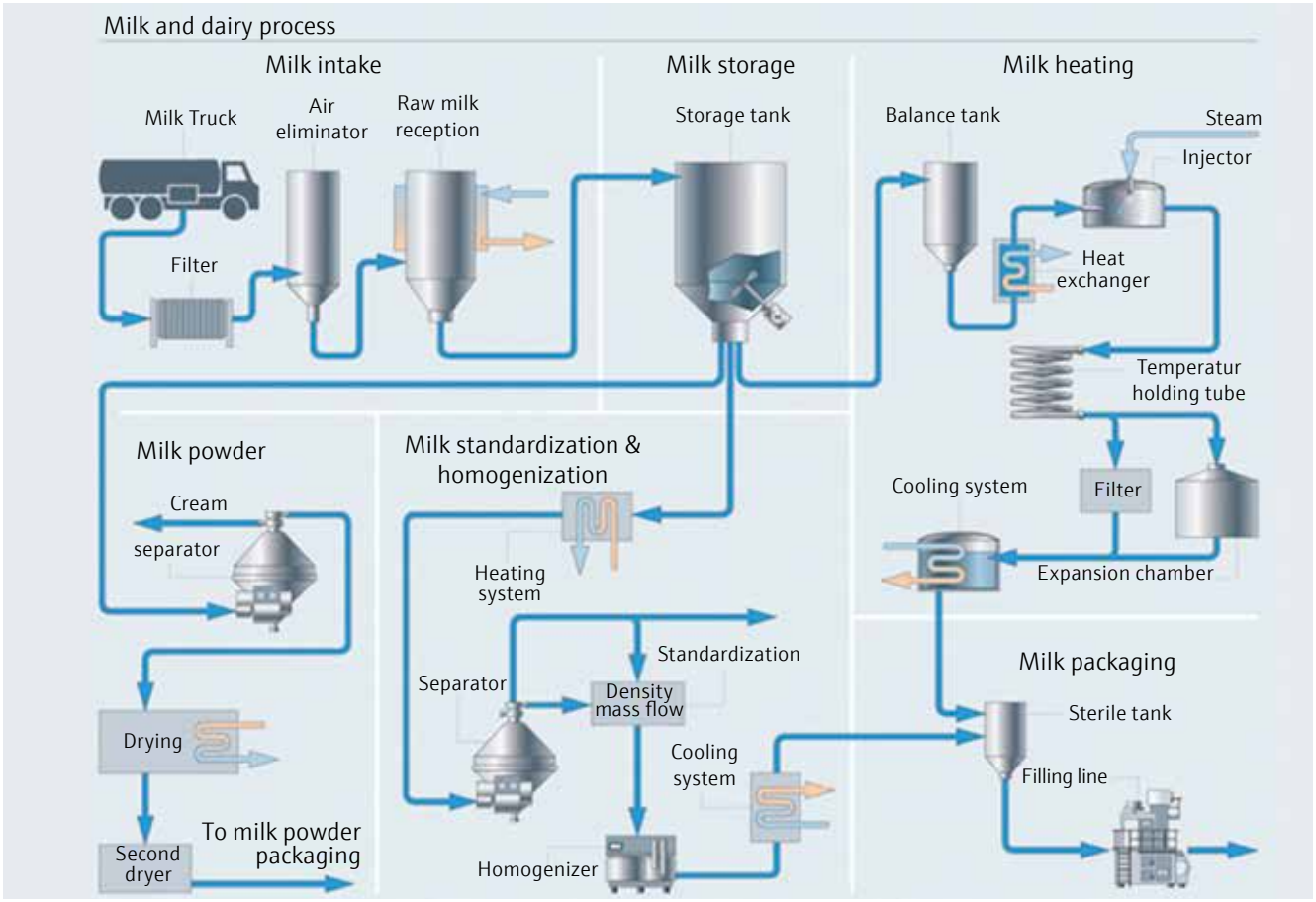
Universal data manager with up to 12 universal inputs

- Secure data archiving in internal memory and additionally on SD card
- Common interfaces to make it system-compatible
- E-mail notifications in the event of limit value violations, faults and alarms

RMS621

Steam and heat computer for steam and water

- Up to three full applications in one device
- Calculation based on international standard IAPWS-F97
- Easy-to-read, multi-colored display with color change in the event of an error



The pulse of life sciences

Trust a reliable partner who puts quality, compliance and cost control at the heart of life sciences

It is a daily task to meet stringent GxP regulations and productivity goals throughout your product lifecycle. You can rely on our FDA-compliant data manager as well as our highly-qualified and experienced engineering and service teams. We partner with you to generate process optimization, higher plant availability and continuous improvement.

Our excellence, gained at the heart of the sector, will help you to:

- Streamline your projects
- Attain operational experience
- Make the right decisions

Advantages at a glance

- Maximum product safety and reliability through tailored products to meet industry requirements and regulations
- Products designed to facilitate verification of compliance with important process parameters
- Accurate measurement and calculations guarantee savings of raw material, water, energy and labor costs

Product highlights

Memograph M RSG45

Advanced data manager for reliable data storage and visualization

- FDA 21 CFR 11-compliant data recording and user administration
- Easy data exchange between field level and control level
- Up to 20 universal (U, I, TC, RTD) or HART® inputs and up to 14 digital inputs
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Loop powered field display unit ensures a better process overview on site

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RMA42

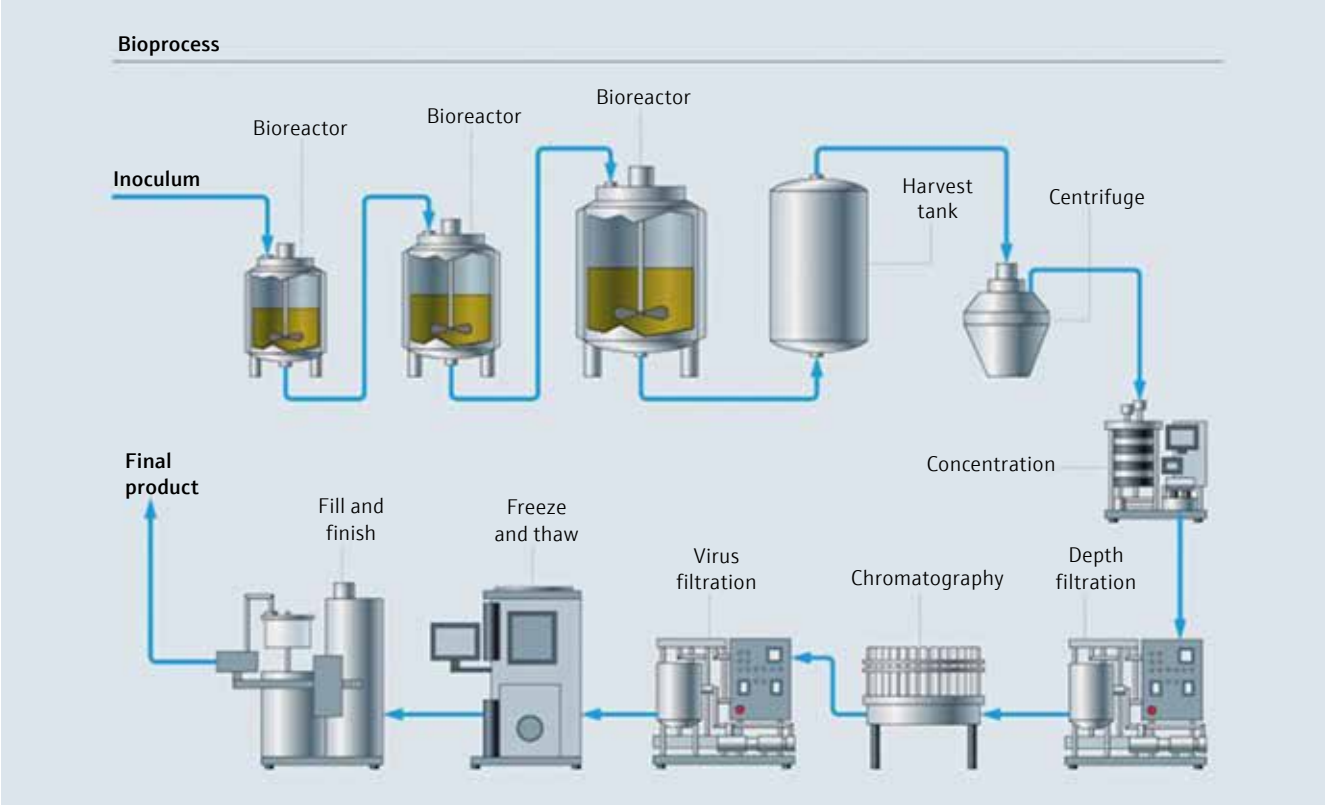
Process transmitter with control unit

- Processes and transfers up to 2 analog measuring signals
- 2 mathematics channels to calculate the sum, difference, multiplication, mean value and linearization via a maximum of 32 support points
- Limit value monitoring with the help of 2 relays

RIA15

Loop powered display unit in the field or panel-mounted housing

- Better insight into the process through visualization of the 4 to 20 mA signal or all of the 4 HART® values of a sensor
- Compact design means the device fits in any application yet still offers excellent readability
- Diagnostic tool for HART® networks based on simple signal analyses



Water is our life

Water quality, discharges, regulations, the environment, just rely on a trusted partner

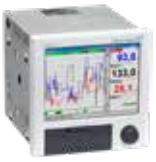
As budgets shrink and legislative demands soar, we bring expertise for challenging needs.
Safe potable water, discharges, environmental penalties, water infrastructure for developing countries, energy monitoring, the rising quantities of sludge from wastewater treatment and the opportunities they create for biogas. We make sense of it all, with experienced thinking supported by process technology solutions for your every need.

Through working with water in over 100 countries, Endress+Hauser offers a refreshing alternative.
- Improve plant safety and availability
- Optimize costs in your internal water processes
- Support your risk and failure management

Advantages at a glance

- Cost-effective product and service portfolio for any applications, e.g. for drinking water, wastewater and sewage, desalination
- Meeting internationally recognized standards/ recommendations for drinking water applications
- Highest efficiency by easy commissioning, operation and maintenance of instruments

Product highlights



Ecograph T RSG35

Universal data manager with up to 12 universal inputs

- Secure data archiving in internal memory and additionally on SD card
- Common interfaces to make it system-compatible
- E-mail notifications in the event of limit value violations, faults and alarms

RIA452

Process display unit with pump control

- Alternating pump control for even utilization of up to 8 pumps
- Simple flow measurement in open channels and weirs; all common channel types are stored in the device

HAW562 and HAW569

Customized overvoltage protection for top-hat rail or installation in the field

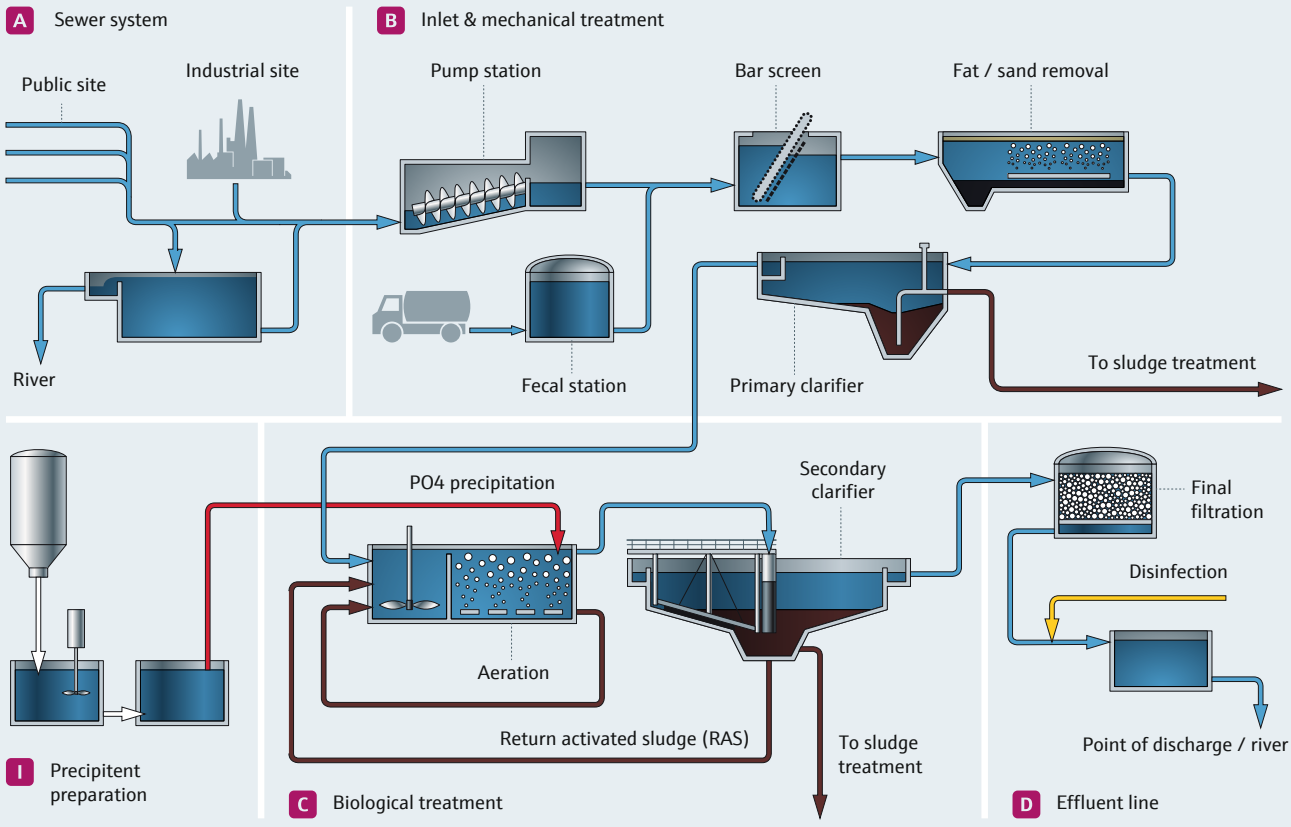
- Expensive sensors and devices are safely protected against overvoltages
- Can be used in a variety of applications thanks to Ex approvals, SIL 2-compliance and compatibility with established communication signals and fieldbuses

RN221N

Active barrier for reliable separation of 4 to 20 mA standard signal circuits

- Suitable for numerous applications thanks to multi-voltage power supply unit, global Ex approvals and SIL 2
- Front-panel HART® communication jacks and integrated 250 Ohm resistor
- Optionally available with HART® diagnostics to monitor the HART® status byte of the connected sensor

Wastewater treatment



Power up your plant

Power plants play a vital role. We help minimize downtime whilst delivering safety and productivity

Your plant needs a multi-skilled, versatile partner. You need reliable solutions that meet your application requirements and industry quality standards. And you may need to upgrade ageing plants with proven and state-of-the-art technologies, to keep the output consistently high. As the industry shifts towards natural gas, renewables and the new market dynamics driven by shale gas, our mission is to provide the all-round support and experience you need. This includes elevated standards of safety for your staff.

And the ability to meet even-higher environmental demands in flue gas cleaning processes such as SCR catalysts for nitrogen oxide reduction, electrostatic precipitators (ESPs) for particle separation, and limestone scrubbing processes for desulphurization.
When you choose us, you:

- Boost the efficiency of your plant
- Heighten safety
- Maintain expertise

Advantages at a glance

- Functional safety: IEC 61508 SIL 2/3 certified
- Intelligent instrumentation with advanced diagnostic functions
- Minimized downtime and highest safety through modern instrumentation

Product highlights

EngyCal® RH33

Custody transfer heat meter for water, water-glycol mixtures and other liquids

- Used for recording and billing heat and cold quantities
- Calibrated, electronically paired temperature sensors ensure the highest accuracy and enable replacement of individual temperature sensors
- Logging of current and counter values, of error messages and limit value violations
- Remote readout via Ethernet and fieldbuses

RIA15

Loop powered display unit in the field or panel-mounted housing

- Better insight into the process through visualization of the 4 to 20 mA signal or all of the 4 HART® values of a sensor
- Compact design means the device fits in any application yet still offers excellent readability
- Suitable for functional safety applications due to SIL interference freeness

RMS621

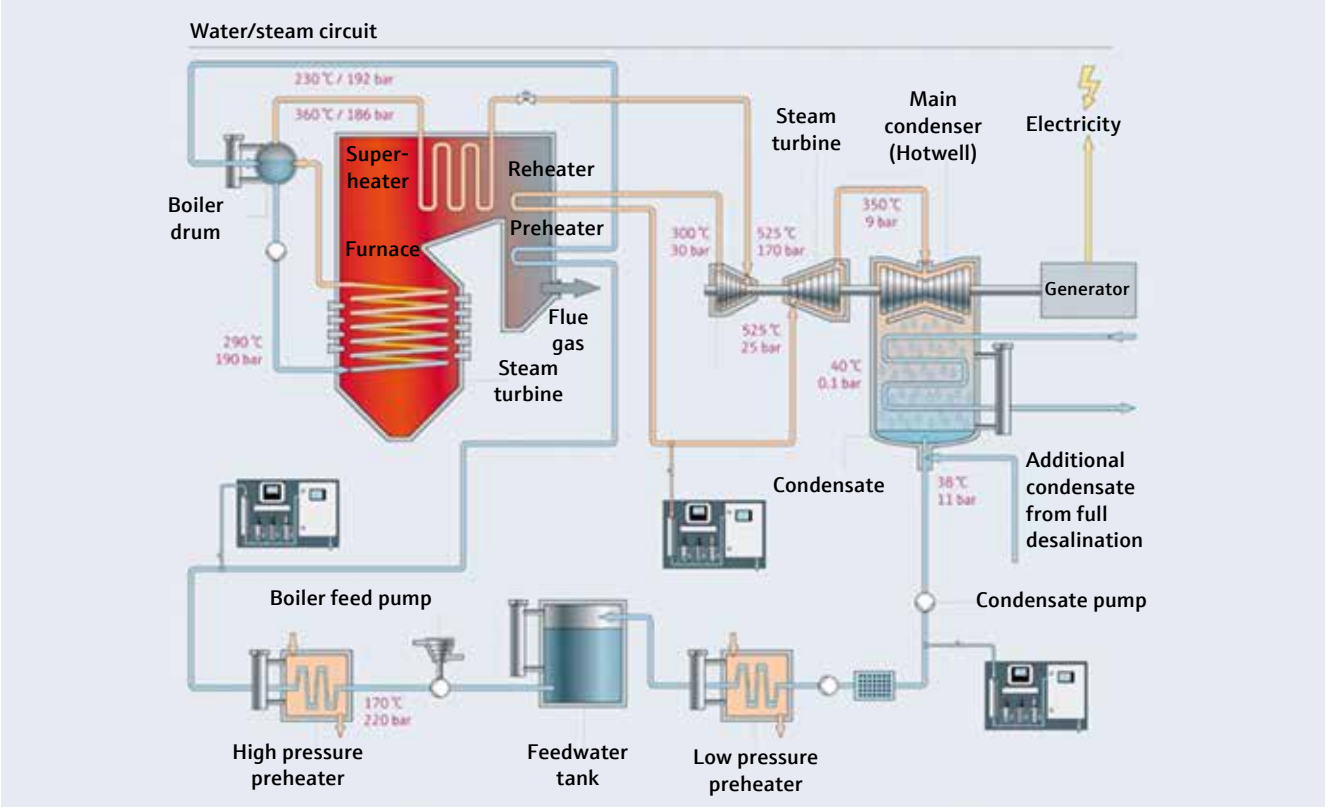
Steam and heat computer for steam and water

- Up to three full applications in one device
- Calculation based on international standard IAPWS-F97
- Online help function for all parameters

RMA42

Process transmitter with control unit

- Processes and transfers up to 2 analog measuring signals
- 2 mathematics channels to calculate the sum, difference, multiplication, mean value and linearization via a maximum of 32 support points
- Limit value monitoring with the help of 2 relays



A data manager for every application

Model	Minilog B - RDL10	Ecograph T - RSG35
Features	Data logger with 2 input channels for recording and storing analog and digital values.	Universal data manager with up to 12 universal inputs. Display, recording and monitoring device with excellent price/ performance ratio.
Construction		
Universal analog inputs/HART® for RSG45	1	0/4/8/12
Digital inputs	1	6
Analog outputs	-	-
Loop power supply	-	1 x 24 V DC, max. 250 mA
Count inputs (impulse)/operating time counter	Yes	Yes
Event input	Yes	Yes
Alarm set points/relays	2 per channel/-	30 / 6 relays
Measured value display	7 digit LCD	TFT color graphic, 178 mm (5.7 in) Resolution: 640 x 480 pixel
E-mail functions Integrated web server CSV file format OPC server	via ReadWin 2000 - via ReadWin 2000 -	Yes Yes Yes (direct) Yes (optional software)
Mathematics function Integration Calculation factor for integrated quantities Batch function Tele-alarm function Wastewater & storm overflow function Energy software (water + steam)	- Yes Yes - Yes - -	4 mathematics channels (optional) Yes Yes - - - -
Text input	-	-
Memory	internal	Internal memory + SD card + USB stick
Scan rate	1 s	100 ms
Interfaces	RS232	USB (front) Ethernet (back), RS232/RS485 (optional), Modbus RTU/TCP Slave (optional)
Power supply	Lithium battery, or external supply 7 to 30 V DC	90 to 250 V AC 24 V AC/DC
Protection class	IP65/NEMA4	IP65/NEMA4 (front)
Dimensions (WxHxD) in mm (in)	100 x 100 x 61 (3,94 x 3,94 x 2,4)	144 x 144 x 158 (5,67 x 5,67 x 6,22)
FDA 21 CFR 11 / User administration	-	-
Device description as from page	20	22

Model	Memograph M - RSG45	Memograph M - RSG45 DIN rail
Features	Advanced Data Manager with universal use of analog HART® and digital signals. Saves, visualizes, analyzes and communicates. Integration of process pictures.	Advanced data manager and communication manager with universal use of analog HART® and digital signals. Saves, visualizes, analyzes and communicates.
Construction		
Universal analog inputs/HART® for RSG45	0/4/8/12/16/20 or up to 40 for fieldbus	0/4/8/12/16/20 or up to 40 for fieldbus
Digital inputs	6 or 14	6 or 14
Analog outputs	2	2
Loop power supply	1 x 24 V DC, max. 250 mA	1 x 24 V DC, max. 250 mA
Count inputs (impulse)/operating time counter	Yes	Yes
Event input	Yes	Yes
Alarm set points/relays	60 / 6 or 12 relays	60 / 6 or 12 relays
Measured value display	TFT color graphic, 178 mm (7 in.) Resolution: 800 x 480 pixels	Without display, visualization via web server
E-mail functions Integrated web server CSV file format OPC server	Yes Yes Yes (direct) Yes (optional software)	Yes Yes Yes (direct) Yes (optional software)
Mathematics function Integration Calculation factor for integrated quantities Batch function Tele-alarm function Wastewater & storm overflow function Energy software (water + steam)	12 mathematics channels (optional) Yes Yes Optional Optional Optional Optional	12 mathematics channels (optional) Yes Yes Optional Optional Optional Optional
Text input	Can be preset 30 x	Can be preset 30 x
Memory	Internal memory + SD card + USB stick	Internal memory + SD card + USB stick
Scan rate	100 ms	100 ms
Interfaces	USB (front) RS232/RS485, PROFINET I/O device, EtherNet/IP adapter, Modbus RTU/TCP slave, Modbus RTU/TCP Master, Ethernet, USB (back)	RS232/RS485, PROFINET I/O Device, EtherNet/IP Adapter, Modbus RTU/TCP Slave, Modbus RTU/TCP Master, Ethernet, USB
Power supply	90 to 250 V AC 24 V AC/DC	90 to 250 V AC 24 V AC/DC
Protection class	IP65/NEMA4 (front)	IP20/NEMA1 (complete device)
Dimensions (WxHxD) in mm (in)	196 x 150 x 159 (7,7 x 5,9 x 6,2)	181 x 136 x 90 (7,13 x 5,35 x 3,54)
FDA 21 CFR 11 / User administration	Yes	Yes
Device description as from page	24	24

Minilog B
The cost-effective and robust data logger

Dual-channel measured data collection device

For stand-alone applications

The Minilog B is used to display and record measured data from analog and digital input signals. It can be applied where a compact data logger is needed.

The most important features of this device are:
- 0/4 to 20 mA/ 0 to 1 V/ Pt100 input
- One second scan time for minimum, maximum and average value calculation
- Input 2: Potential-free contact for event, operating time or impulse counters (max. 25 Hz)
- 1 min. to 24 hours storage cycle
- Stores up to 64,000 measured values (FIFO principle)
- Compact IP65 field housing
- 7 to 30 V DC power supply or internal battery operation
- RS232 interface for data exchange and direct set-up using a PC or modem connection.
- ReadWin 2000 for device set-up and data management is delivered free of charge with the unit.

In addition to data storage the data logger also monitors two set points. Violation of either of these set values is indicated in the display. The device can be set up to either continuously record or record only on a set point violation (in the preset storage cycle).

The tele-alarm function (option) makes it possible to transmit a message to a computer or mobile phone using the telephone network or wireless modem when the unit enters a set point violation or the digital input is active.
The Minilog B works using an integrated lithium cell for reliable long term operation (up to 2 years) – alternatively for fixed installations or modem operation it can also be supplied for use with an external power source.

Data visualization

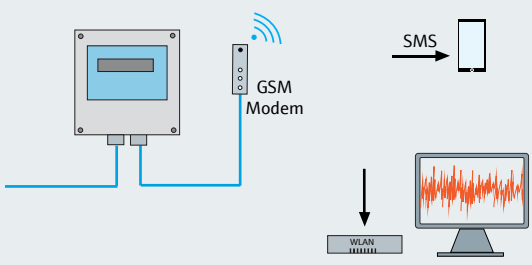
The recorded data is read out, transmitted and visualized using the ReadWin 2000 PC operating software.

Minilog B application areas are:

- Data recording for temperature, humidity, pressure, flow, level and analysis values
- Temperature control: warehouse temperature and transport temperature measurement
- Operating time recording
- Access control
- Piece part and quantity recording
- Quantity recording by integration of the analog signal
- Remote monitoring/data transmission using modem connection
- Tele-alarm, SMS in fault condition
- Where mobile recording and storing of measured values is necessary

The advantages of ReadWin 2000 are:

- Storage of the device set-up in a data base
- Readout of the measured values stored in the unit
- Measured value display as curves, columns and tables
- Printout of graphics, tables and device set up parameters
- Data export to spreadsheet programmes (e.g. Excel, Lotus etc.)
- Software for commissioning, communication and analysis in one tool



Tele-alarm, makes fast messaging possible.

Application examples

Continuous temperature recording in a transporter refrigeration cell using a Minilog B with a Pt100.

Molasses level measurement in customer specific tanks of a supplier. The Minilog B stores the customer usage and informs the supplier of the actual level in the storage tank. The data is collected at a central supply point and is available for the planning of just in time delivery.

Automatic pump operating time recording using the Minilog B.

4 Minilog B devices record wastewater inflow on a large treatment plant in South East Asia.

2 Minilog B devices for level measurement and dosing.

Ecograph T
Universal data manager

Monitor, visualize, record and communicate process values

Secure data recording made easy

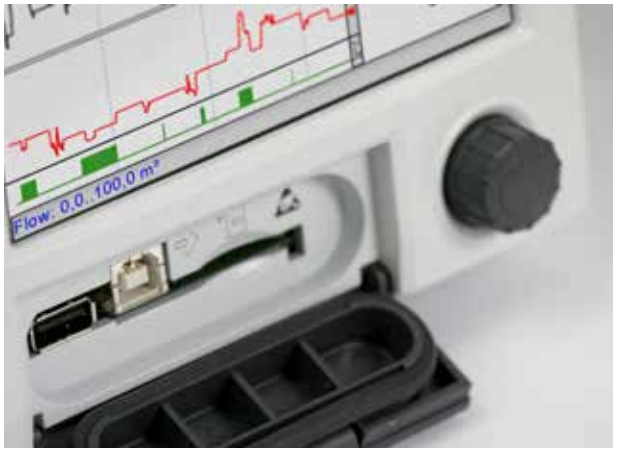
The Ecograph T videographic recorder is the simple solution to record data manipulation-proof.

With its up to 12 universal analog inputs and various visualization modes, such as curves, waterfall and bar graph, it is universally usable in many applications. With its additional 6 digital inputs pulses can be recorded, operating times and switch states can be registered or time can be synchronized.

The recorded measurements are stored on a 128 megabyte internal memory and optionally on a separate SD card.

By using modern interfaces such as Ethernet and various communication possibilities like Modbus TCP/RTU slave, data can be automatically transmitted to primary systems. Through this a simple system connection is possible.
Up to 30 limit values can be freely assigned to the channels. Limit value infringements are displayed and stored in the device. Furthermore 6 internal relays can be used for alarm transmission.

The flexibility of the Ecograph T is increased through the optional 4 mathematics channels. The device can make individual calculations which can be simply entered using a formula editor.



An all-round package

Furthermore the Ecograph T convinces by its intuitive operation. The parameter set-up of the video graphic recorder can be carried out user-friendly by means of the integrated web server without any additional software having to be installed. Also the visualization of the instantaneous and the recorded data is possible using the web server.
Moreover, the recorded data can be selected, saved and visualized manipulation-proof in a SQL database from the device or the SD card with the help of the essential version of the field data manager software which is part of the standard device delivery package.
This complete package and the excellent price-performance ratio make the Ecograph T an uncomplicated and cost-efficient solution for many applications.

Application examples

Ecograph T – Typical application areas

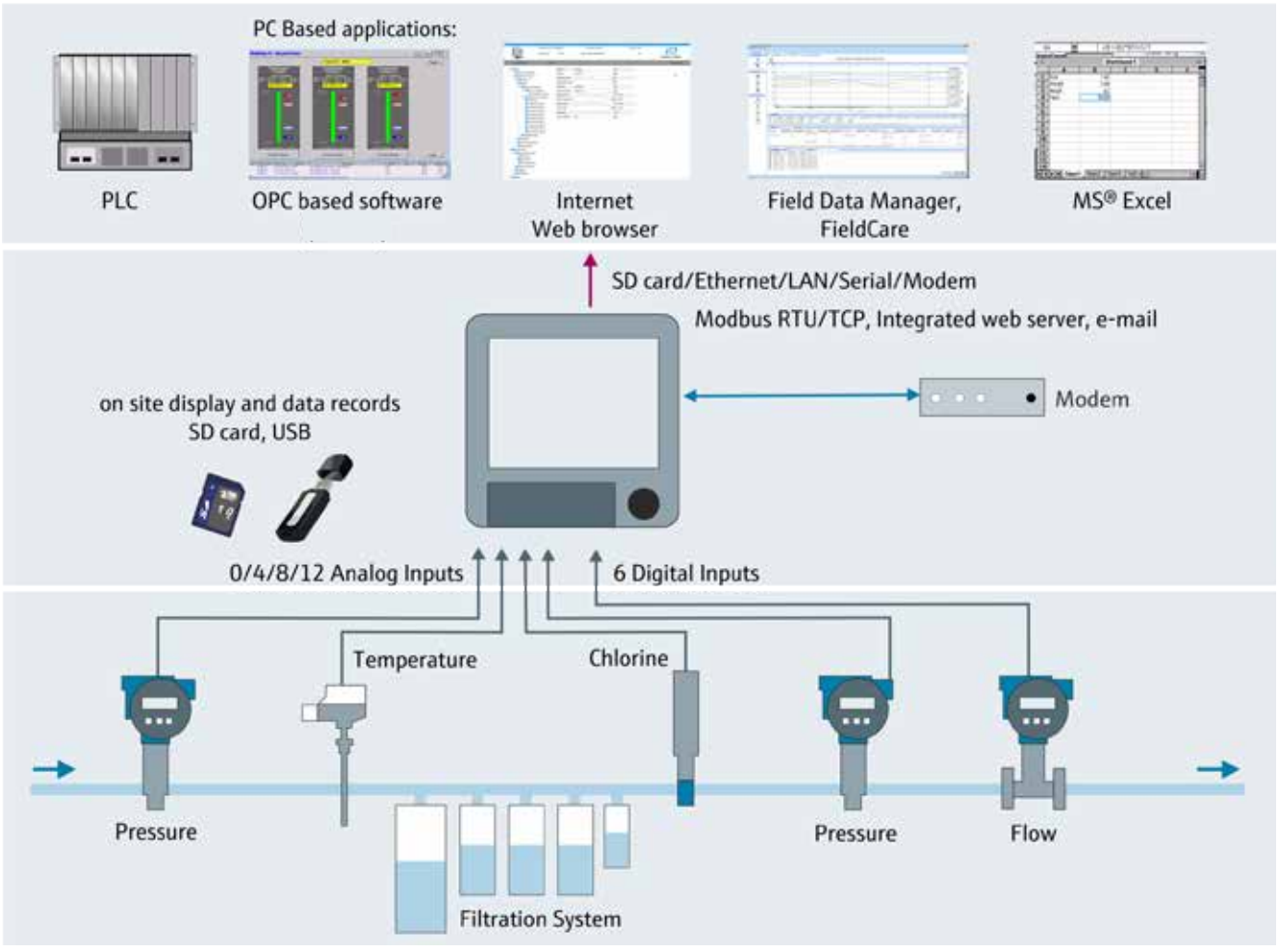
The Ecograph T is the solution in all sorts of business areas and applications such as:

- Quality and quantity monitoring water and wastewater industry
- Process monitoring in power stations
- Display and recording of critical process parameters in production processes
- Tank and level monitoring
- Temperature monitoring in metal processing

Everywhere where process parameters need to be visualized, recorded, analyzed and monitored the Ecograph T is the versatile and cost-efficient answer!

Advantages of the Ecograph T:

- Versatile: Up to 12 universal inputs of the most common measurement signals
- Clear: 5.7" TFT display for the indication of the measurements in up to four groups in digital, bar graph and curve presentation modes
- Fast: Sampling rate of 100 ms for all channels
- Compact: Low installation depth, save place and money
- Simple: Intuitive operation via navigator and user-friendly parameter set-up using an integrated web server or FieldCare
- Safe: Reliable archiving reliably using the internal memory and separate SD card
- Informative: E-mail notification with alarms and limit value infringements
- System capability: Common interfaces such as Ethernet, RS232/485 (optional) and USB
- Communicative: Slave function for Modbus RTU/TCP (optional)
- Intelligent: Calculations using 4 optional mathematics channels
- Complete: Including the Essential version of the Field Data Manager software for manipulation free data storage and visualization in the scope of supply



System overview: Application example of a filtration system

Memograph M
Advanced data manager

Easy, flexible and reliable access to your data and connected devices

Panel version with 7“ TFT display, local operation using keyboard and navigator (jog/shuttle dial)

Panel version with “7” TFT display and touch control

DIN rail version (without display) for DIN rail mounting, with integrated web server

The state-of-the-art Memograph M data manager is so much more than simply a data manager; it is a flexible and efficient system for organizing process values. It can be easily and quickly adapted to your application thanks to its intuitive operation concept.

The measured process values are clearly displayed on the 7“ TFT screen and reliably logged in the device memory. Furthermore, up to 60 limit values are monitored and analyzed. The measured and calculated values can be very easily forwarded to higher-level systems using standard communication protocols such as PROFINET, EtherNet/IP or Modbus RTU/TCP for example. Individual plant modules can be connected to one another in the same way. Thanks to the various application packages, such as batch, tele-alarm, water/wastewater or energy calculation, the optional stainless steel front and Ex approval, the device is suitable for use in a broad range of industries including those listed below:

- Hygiene applications in the food and beverages industry and in life sciences
- FDA-validated applications
- Monitoring critical parameters in filtration systems for drinking water both in rivers and in rain spillway basins in sewage treatment plants
- Recording energy, gas and fluid consumption in all sectors
- Saving and monitoring the performance characteristics of turbines and boilers in power plants

The Memograph M is always the correct choice whenever a solution is required for the logging, visualization, analysis and transmission of process parameters.

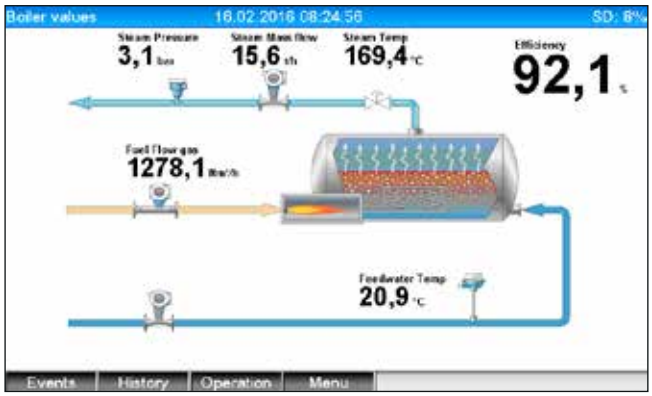
The Memograph M DIN rail data manager is available as a device without a display for mounting on a DIN rail in the cabinet. The functionality is compatible with devices which have a display.

The Memograph M DIN rail is perfectly suited to applications where there is no requirement for an onsite display. Visualization of the measured data takes place preferably via the integrated Web server. The data manager can be integrated into the most diverse system architectures thanks to the various interfaces and communication options and is also suitable for IIoT/cloud applications.


Endress+Hauser
-0,1
15,3
Events
History
Menu

Memograph M

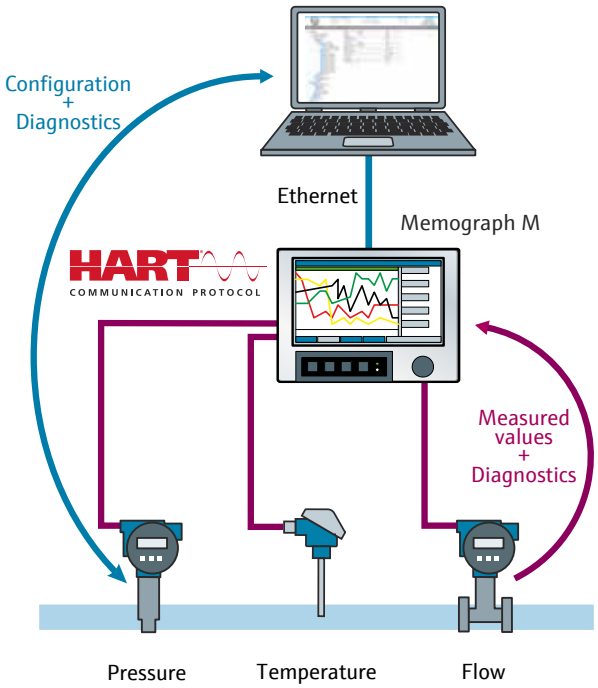
Process visualization made easy



Process screen with digital measured values

Memograph M optimally meets the requirement to recognize the plant status at a glance with a free of charge configuration tool. A fast and easy process visualization can be realized with two files, an image in BMP format and an initial file containing coordinates for the measured values. Whether in pumping stations, tanks or coal dumps, Memograph M provides information on what is going on in the plant at a glance.

Integrated HART® inputs – Exploit the full potential of HART® devices not only the 4 to 20 mA signal!



The Memograph M RSG45 offers a genuinely unique selling position with the new inputs for HART® signals. The HART® signal is supported by most sensors in the field. With the HART® inputs, the RSG45 can use both the 4 to 20 mA analog signal and all four HART® values of a connected field device and process up to 40 HART® values simultaneously. HART® multidrop is also possible with up to 5 field devices per channel.
The RSG45 thus helps to obtain more information from the field. It also offers a HART® gateway function. This means direct access from the PC configuration software to the field device without the need for an additional modem. Configuration of the field devices is thus possible from the measuring control room. Furthermore, detailed field device status information is available.

Advantages at a glance:

- Process transparency increases plant safety and availability. Predictive maintenance means that unscheduled process interruptions and outages can be avoided.
- Easy access to field devices ensures time savings

Integrated web server – Ideal functions for remote maintenance of the RSG45

The integrated web server means you can access current and historic process data at any time and any place using a conventional web browser. Remote access and remote control of the device are possible in addition to the display of current values including status and device state. Furthermore the integrated web server features a number of excellent, new functions, e.g.:

- Option to print out, save and import device settings
- Firmware update of the RSG45 possible
- Protection against unauthorized access of the RSG45 through the use of 3 password-protected user levels.
- Online visualization:
  - Trend display
  - Complete device parameter configuration
  - Password-protected access

Advantages at a glance:

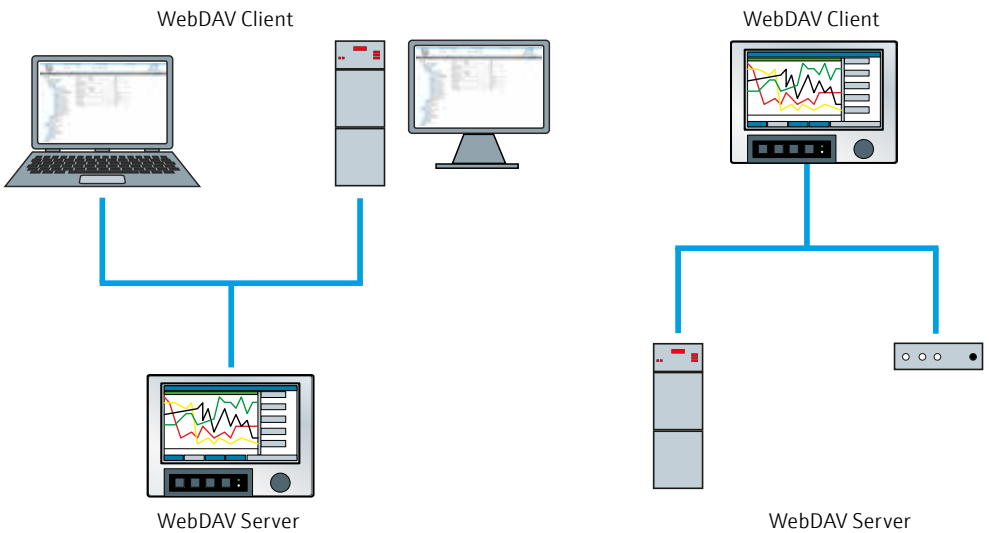
- Fast and easy display of current and historic data via web browser
- Better insight into the process at all times and anywhere in the world
- Time- and cost-saving commissioning and operation without additional configuration software

WebDAV – Data exchange that knows no limits

WebDAV (Web Distributed Authoring and Versioning) is an open standard for the provision of data on the Internet/ Intranet. The WebDAV server and client function have been implemented in the Advanced Data Manager. Using the server function it is possible to read out the files on the SD card of the RSG45 with the help of a WebDAV client, e.g. a web browser. Using the client functionality the RSG45 automatically transfers the recorded data to a connected WebDAV server (e.g. NAS drive).

Advantages at a glance:

- Time-saving data access and data transmission using standard protocol
- Increased flexibility as no special add-on is required on the PC
- Secure data transmission possible using SSL encryption



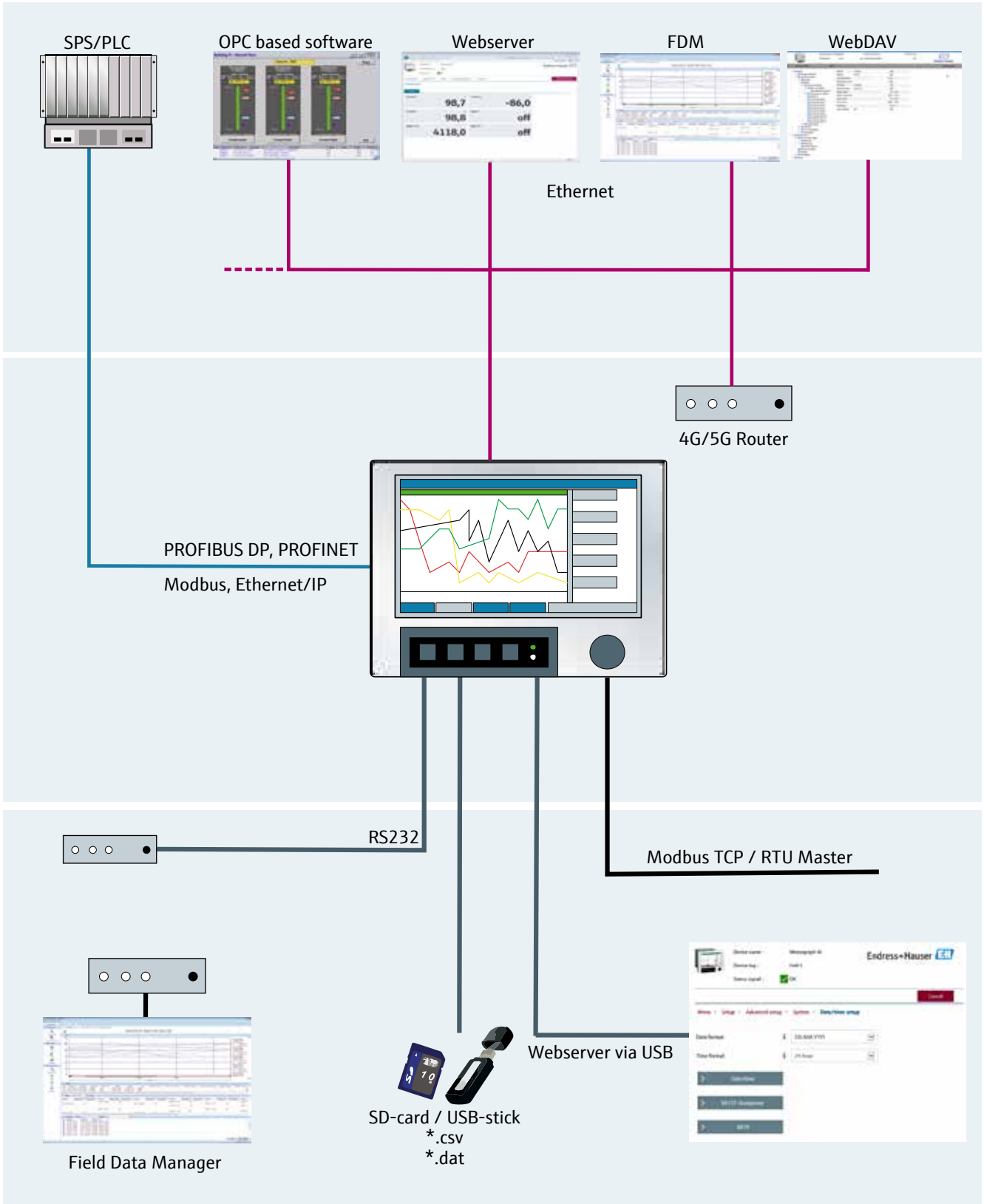
Stainless steel front with touchscreen and Ex p approval

The RSG45 is available with an optional stainless steel front and touchscreen. Operation is easy and fast even when wearing gloves thanks to the optimized, touch-based user interface. Scrolling through historic data or changing the various display groups is easy with a simple swipe. The main emphasis of this stainless steel version made from 316L material is on critical ambient conditions. Cleaning is easy due to the hygiene-compliant design and the device can be operated directly in hazardous areas when the stainless steel front is combined with installation in a flameproof cabinet.

Alternatively the device can be easily operated on site or using the PC software. A navigator and 4 function keys enable dialog-guided operation. The Memograph M can be very easily operated with a USB keyboard or mouse.

Device configuration is also possible using the FieldCare or DeviceCare PC software. In this case, the menu structure and appearance are the same as on the device to make configuration easier.

System integration and communication



The Memograph M can be easily integrated into higher-level systems. Industrial Ethernet-based communication protocols such as PROFINET or EtherNet/IP play a central role. These protocols are gaining in importance in the process industry and increase the device's application flexibility.

In addition to these products, established fieldbuses such as PROFIBUS® DP or Modbus RTU/TCP are also available. The Memograph M functions as the slave for all of these fieldbuses. Up to 40 analog signals and 14 digital signals can be transmitted in both directions, recorded and saved using this version. The RSG45 is available as a master for Modus RTU and TCP, making it possible to set up a standalone bus system.

Automatic signal evaluation

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.:

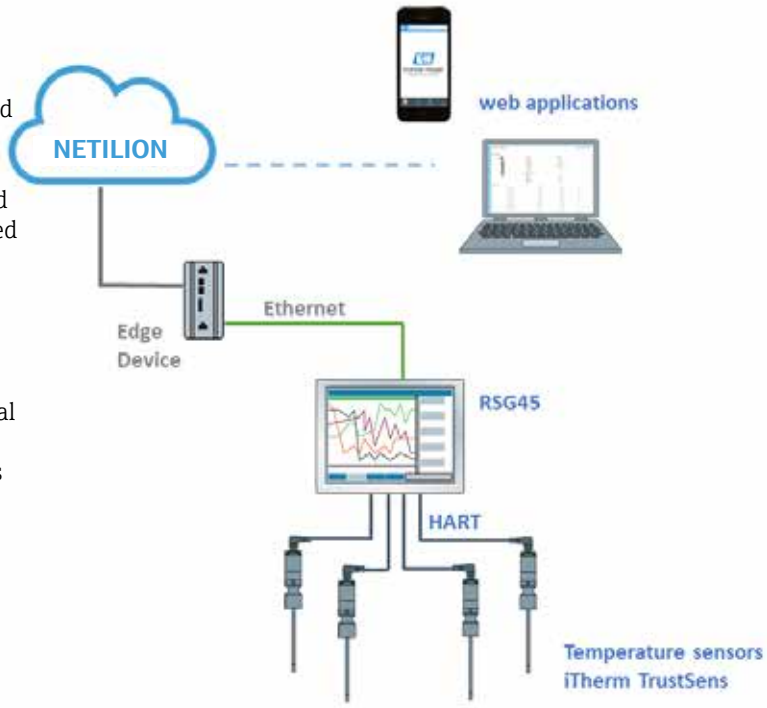
- Automatically calculates averages, minimum and maximum values for the analog measurement points
- Calculates intermediate, daily, monthly, yearly reports (up to 4 analyses possible)
- Shows counter values, operating times and quantities

Another advantage of these analyses is that the values are determined by using the actual measured values and not afterwards by using already optimized values. This gives an exact overview at all times.

IIoT applications

The Memograph M is a flexible and efficient system for organizing process values. The measured values can be easily forwarded to higher-level systems using standard communication protocols – either directly or after pre-processing (application packages and maths functions). In addition to analog interfaces, common digital communication protocols (HART, Modbus, etc.) are also available to communicate with the field level (instrumentation). The data managers can be easily and quickly integrated into the most diverse IT system architectures using standard interfaces based on RJ45 (Ethernet TCP/IP, OPC). As well as user data (measured value), condition data and service data for the connected sensors can also be recorded and communicated.

The Memograph M can thus also be used as an application-focused edge device for IIoT solutions. The data are transferred between the various network structures in the „Industrial Internet of Things". Internal storage means that data can also be held offline in the event that Internet connectivity is temporarily lost; this is necessary, for example, if the sensor technology has no internal data memory. The management and processing of accumulated data are considerably more efficient while at the same time data traffic and the network load to the cloud are reduced.

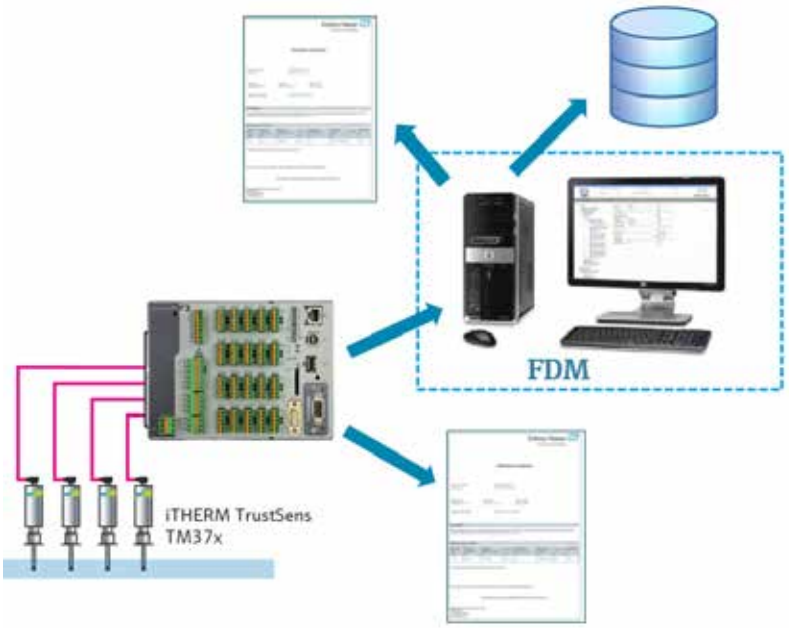


TrustSens Calibration Monitoring with the Memograph M RSG45

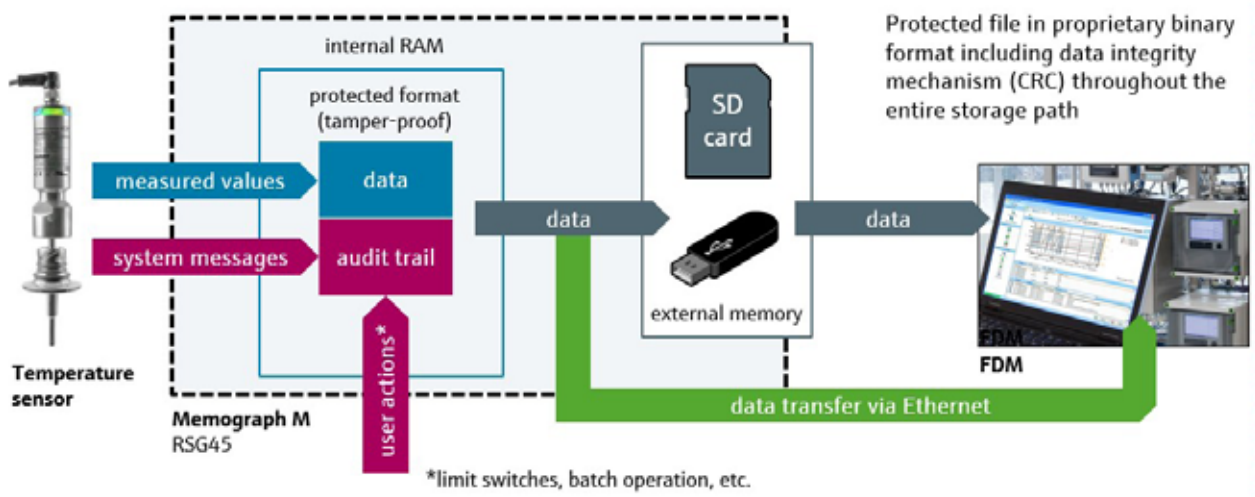
Applications in the life sciences and food & beverage sectors rely on the highest standards in process safety. Calibration of the sensors is vital in order to ensure process and product safety. Today's standard procedure involves manual calibration of temperature sensors which is very costly and time-consuming.

Endress+Hauser's new iTHERM TrustSens is the first self-calibrating temperature sensor on the global market. iTHERM TrustSens offers a solution for inline calibration with a minimum of effort and 100% compliance.

When used in conjunction with Endress+Hauser's RSG45 Data Manager, this thermometer offers automated TrustSens calibration monitoring, i.e. the automatic creation of calibration reports in the RSG45. If FDM (Field Data Manager software) is used, it is also possible to save the reports automatically, e.g., on a server.



Data security – FDA 21 CFR Part 11 – compliant data recording



FDA 21 CFR 11– compliant data recording is often needed particularly in the pharmaceutical industry but also often in the context of IT security requirements. As part of fulfilling this requirement, electronic signatures are given the same legal status as a conventional signature. The Memograph M features FDA-compliant data recording and user administration as standard and it can be activated as required.

This functionality includes:

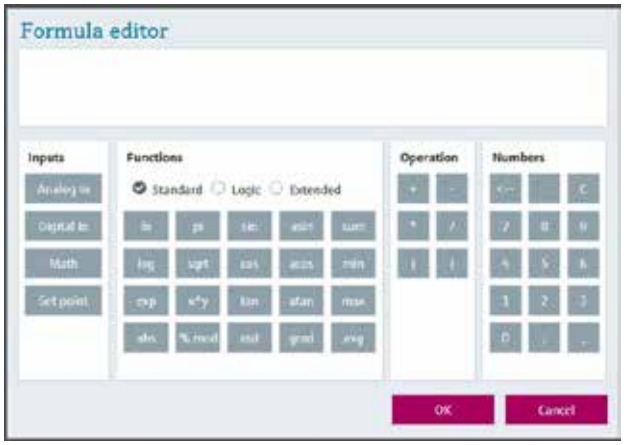
- Integrated user and rights management
- ID + password = electronic signature
- Prompt to change password at regular intervals
- Key lock for access protection
- 3 invalid log-in attempts results in blocked access

Memograph M

Application packages

Mathematics function (optional)

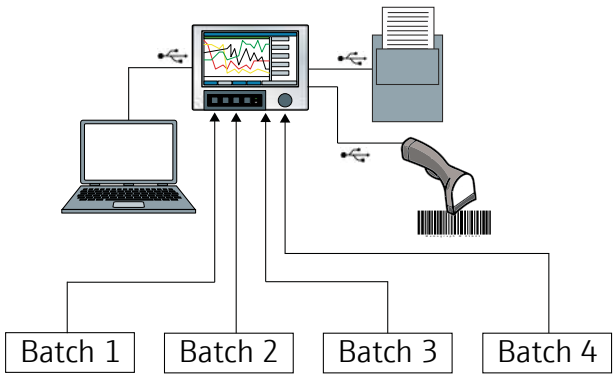
In addition to the universal inputs eight mathematics channels are available which can be used as independent channels. The formulae of the individual mathematics channels can be easily set-up using an easy-to-use editor with predefined functions, similar to MS Excel. Moreover, integration or a 32 point linearization is possible for each channel.

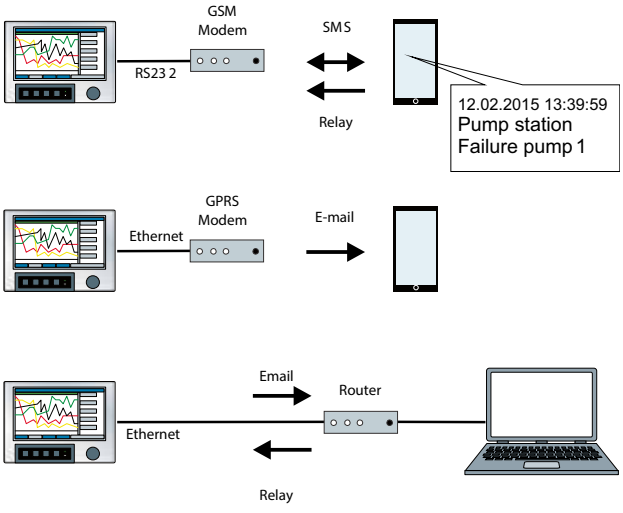


Batch monitoring
Secure recording of up to 4 batches

Batch monitoring serves for secure recording and visualization of discontinuous processes which have a specified beginning and an end. No matter where these processes take place e.g. in food industry such as the ripening process of yoghurt, or in mechanical construction where temperature ovens are monitored – Memograph M is the right solution.
Up to 4 independent batches can be documented in parallel. At the end of a batch run the batch report can be printed out per PC software or directly using a printer connected to the unit via USB.
The batch report contains:

- Complete information regarding the product and process run
- Batch number
- Batch time, start and stop times for the batch run
- Min.-/max-/mean values of all active channels, quantities and operating times
- Event log / audit trail entries
- Front-end or controller batch control is possible.





Tele-alarm
Plant remote monitoring and control

With the tele-alarm software in the Memograph M it is possible to react even when on the road.
The device creates a message in case of upper and lower limit infringements or on an active digital input. An SMS message will be sent with text that can be individually defined for each incident. The receipt of the message can also be acknowledged by SMS. If the message is not acknowledged further persons can be alerted.
Furthermore, instantaneous values can be easily requested by sending an SMS to the device. Then the Memograph M sends values by SMS.
It is also possible to switch relays via SMS so that e.g. plants or pumps can be re-started. This enables full control over the plant without additional tools!

Memograph M

Application packages

Application package energy - Energy content calculation of water, steam and water-glycol mixtures

With the energy package it is possible to offer heating counters and steam computer functions with optimal data recording as a complete solution package for energy monitoring.

The Memograph M energy package provides e.g. for steam boilers the possibility to calculate and permanently monitor the boiler efficiency. This leads to recognizing and implementing starting points for process optimization and energy savings.

The thermal capacity of water and steam is determined according to the internationally recognized standard IAPWS-IF-97 on the basis of the variables flow, temperature and pressure.

The following values can be calculated:
- Water heat quantity
- Difference in water heat quantity
- Steam heat quantity
- Difference in steam heat quantity
- Water-glycol heat quantity
- Difference in water-glycol heat quantity

Application package wastewater (including tele-alarm) – rainwater overflow tanks and pumping stations safely under control

The Memograph M provides a complete solution for rainwater overflow tanks and pumping stations. It controls the tanks or pumps, alerts in case of alarms via SMS or e-mail and records all relevant data.
The following values can be recorded in case of rainwater overflow:
- Start, duration and end of filling
- Start, duration, end and quantity of overflow
- Filling and overflow frequency

Furthermore data can be transmitted to operating log books via OPC-Server.
Moreover, with this wastewater application a seepage water recording is possible according to ATV (German Association for wastewater).
Thus Memograph M offers a complete package.

Example of a fault message in a pumping station:
11:15 Pump 1 faulty, SMS sent to the responsible technician
11:17 Technician reads the SMS
11:18 An SMS message acknowledgement is sent by the technician to the Memograph M.
11:19 Technician requests and receives the instantaneous values from the Memograph M using SMS
11:21 Relay 2 in the Memograph M is switched via SMS. This means that pump 1 is re-started.
11:22 Pump 1 runs again, malfunction removed!

Energy and application managers

Overview

Model	**EngyCal RH33**	**EngyCal RS33**	**RSG45**
Features	Custody transfer BTU meter for recording and measuring energy flow in heating/ cooling circuits of water, water/glycol mixtures or other liquids, bidirectional measurement	Steam calculator for recording and measuring the mass and energy flow of saturated or super heated steam; bidirectional measurement	The Memograph M with energy package calculates mass and energy flows in water and steam applications
Construction			
Software functions	Heat quantity and heat quantity difference	Mass/heat quantity	Mass/heat quantity, heat quantity difference
Medium - Water - Water/Glycol - Customer-specific liquids - Steam - Gas	 ✔ %-concentration via table - -	 - - - ✔ -	 ✔ Table - ✔ -
Number of applications	1	1	6
Data storage	✔	✔	✔
Calculation standards	IAPWS-97	IAPWS-97	IAPWS-97
Highly accurate temperature measurement CvD	✔	✔	-
Differential pressure compensation	✔	✔	✔
Approvals	MID (EN1434), OIML R75, CSA GP, PTB type approval	CSA GP,	UL, FDA 21 CFR 11
Communication	Web server, USB, Ethernet TCP/IP, Modbus TCP, Modbus RTU, M-Bus	Web server, USB, Ethernet TCP/IP, Modbus TCP, Modbus RTU, M-Bus	Web server, USB, RS232/ RS485, PROFINET I/O device, EtherNet/IP adapter, RTU/TCP slave, Modbus RTU/TCP master, Ethernet
Power supply	100 to 230 V, 24 V AC/DC	100 to 230 V, 24 V AC/DC	90 to 250 V AC, 24 V AC/DC
Loop power supply	1x 24 V DC, 70 mA	1x 24 V DC, 70 mA	1 x 24 V, max. 250 mA
Protection class	IP65	IP65	IP65 (front-panel)
Dimensions (WxHxD) in mm (in)	144x175x138 (5,67x6,89x5,43)	144x175x138 (5,67x6,89x5,43)	190 x 144 x 158 (7.48 x 5.67 x 6.22)
Device description as from page	36	36	24

RMS621	RMC621	RA33
Energy manager for calculation of steam and water; simultaneous calculation of up to 3 applications; split-range-measurement	Universal flow and energy manager for calculations of gases, liquids, steam and water; simultaneous calculation of up to 3 applications; split-range-measurement	Batch controller for filling and dosing of any media with automatic correction of overrun quantity
		
Mass/heat quantity, heat quantity difference	Mass/heat quantity, heat quantity difference, for gases: standard volume, heating value, mass	Volume calculation; 1- or 2-stage operation; manual and automatic correction of overrun quantity
✔ - - ✔ --	✔ via table via table ✔ ✔	- - ✔ - -
3	3	1
-	-	✔
IAPWS-97	IAPWS-97, NX19, SGERG88, AGA8, real gas equations (SRK, RK)	ASTM D1250-04
-	-	-
✔	✔	-
OIML R75	OIML R75, ATEX, CSA, FM	CSA GP, NTEP
1x RS232, 2x RS485, PROFIBUS DP, M-Bus, Modbus	1x RS232, 2x RS485, PROFIBUS DP, M-Bus, Modbus	USB, Ethernet TCP/IP, Modbus TCP, Modbus RTU, RS232
90 to 250 V AC, 20 to 36 V DC	90 to 250 V AC, 20 to 36 V DC	100 to 230 V, 24 V AC/DC
per analog input 24 V / 22 mA	per analog input 24 V / 22 mA	1x 24 V DC, 70 mA
IP20	IP20	IP65
135x108x114 (5,31x4,25x4,49)	135x108x114 (5,31x4,25x4,49)	144x175x138 (5,67x6,89x5,43)
37	37	36

Energy managers

Energy measurements in water and steam

Heating and cooling are energy-intensive processes. As the costs are constantly rising and, depending on the industry the energy costs amount up to 40% of the total industrial production costs, energy optimization is a very current topic. The basis for optimization is the recording of energy flows.

This is where energy managers are used. They use flow, temperature and/or pressure to calculate the energy content of liquids and steam. With the devices EngyCal RH33 and RS33 these values can be recorded as the load curve e.g. with 15 minutes mean values.

Memograph M with application package „energy" for energy-monitoring applications

While in the case of steam applications the total measurement error results from the flow measurement, in case of heat quantity difference measurements in liquids this depends on the temperature difference.

In case of temperature differences of more than 20 °C the error also comes from the flow measurement, in case of differences of less than 20 °C the error mainly results from the temperature measurement. In order to minimize errors in differences of less than 20 °C paired sensors had to be used. EngyCal RH33 offers highly precise, electronic temperature sensor pairs via the Calendar - van Dusen coefficient. For more than one application the RMS/ RMC621 offer great advantages as simultaneous calculation of up to three applications is possible. Alternatively, if more channels are needed the Memograph M can be used. This device can perform up to eight calculations and additionally provides data storage and visualization.

Batch controller RA33

The batch controller RA33 provides precise results and at the same time easy handling.

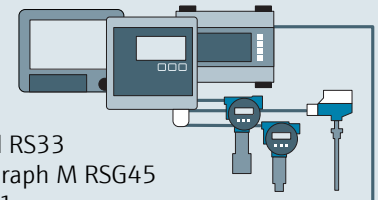
An exact dosing is extremely important in filling processes particularly in case of cost-intensive products. Systematic errors such as the overrun quantity which result from closing times of valves need to be eliminated. The batch controller records these quantities and corrects them with a time-shifted closing command. The measurement of the overrun quantity is done in the background at each further filling process and is then continuously corrected. Thus even continuous changes due to e.g. valve aging or deposits in the piping system are compensated. Furthermore, a volume correction is possible. Here density is compensated by an additional temperature measurement. This saves resources and reduces costs.

Lockable:
The set-up of the device can be locked. This lock can be done either by using a four digit release code or using a hardware switch on the inside of the front cover. Operation via FieldCare is also locked if the hardware switch is activated.

Lead-sealable:
The housing is lead-sealable through a ring on the right lower side of the device and an additional special sealing screw. By means of the hardware switch and the sealing, the device can be verifiably protected against manipulation.

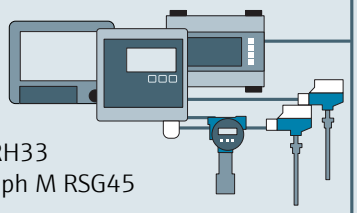
Unchangeable:
The stored measured data and protocols in the RA33 batch controller are unchangeable. Safe storage is guaranteed even on an electrical power outage. The data is stored tamper-proof in the device, transferred and stored in the SQL database of the evaluation software.

Documentable:
The RA33 batch controller supports the direct automatic print out of batch protocols. A printer can either be connected directly to the RS232 interface or the Field Data Manager software can be used for the print out of archived batch protocols.



EngyCal RS33
Memograph M RSG45
RMS621

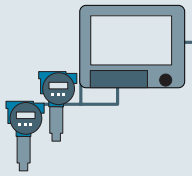
Steam
Flow, pressure, temperature



EngyCal RH33
Memograph M RSG45
RMS621

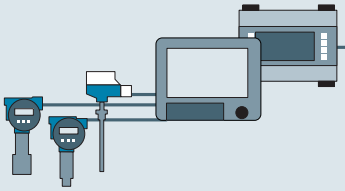
Fluid-Heating & cooling
Flow, 2x temperature

Field Data Manager software
Visualization & manipulation-proof data storage



Memograph M RSG45

Compressed air
Differential pressure monitoring in pipe networks and seqments of the distrubition system, electricity



Memograph M
RSG45
RMC621

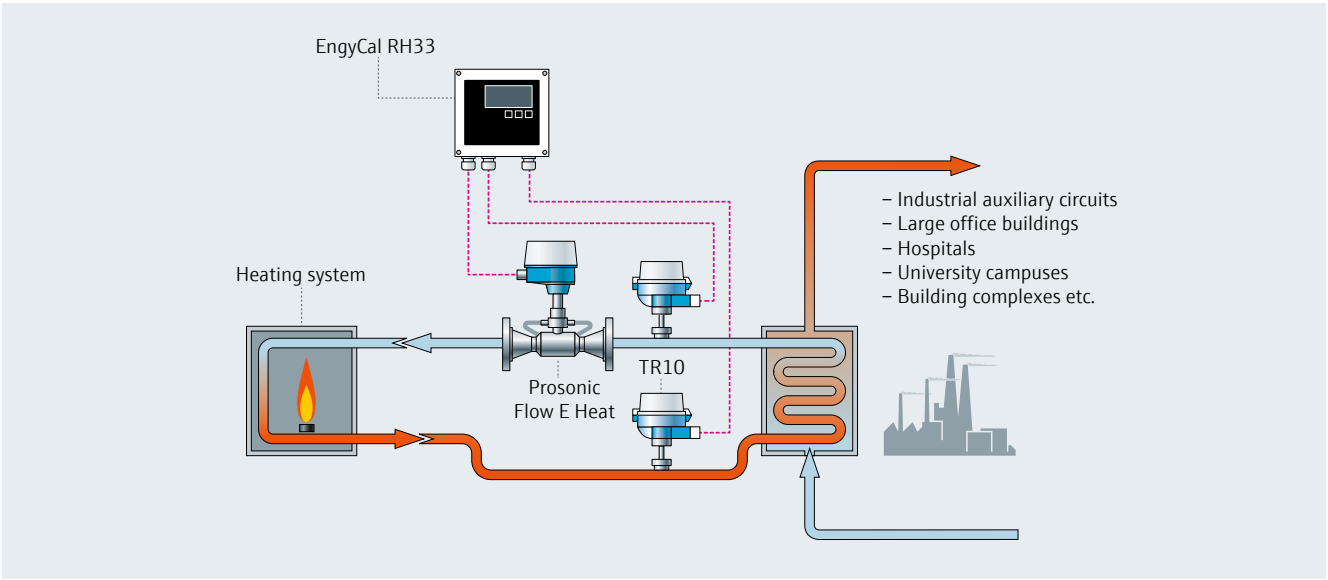
Gas
Flow, pressure, temperature

Application examples

Energy managers

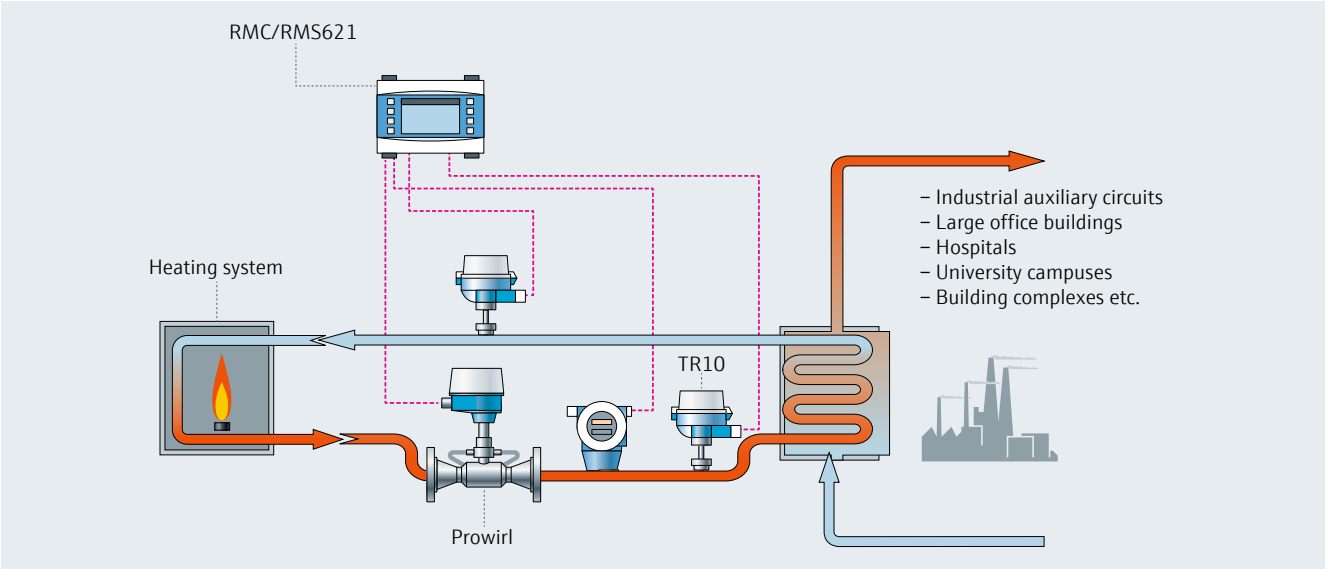
RH33 – highly accurate measurement with CvD coefficient

The RH33 measures the energy flow in a heating/cooling circuit of liquids. Standard sensors for which a calibration determines the CvD coefficient can be used for measurement. These coefficients are entered into the EngyCal RH33 and the sensors are electronically paired. This enables a highly accurate measurement. If one sensor fails it is not necessary to replace both temperature sensors as it is the case with the classic paired sensors. Only one sensor has to be exchanged. This saves time and costs!



RMC621/RMS621 steam and heat difference measurement

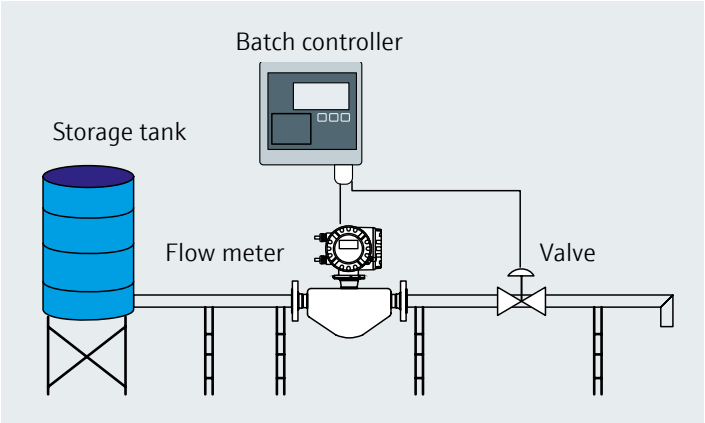
In heating circuits with steam, the steam is condensed in the heat exchanger. The energy content of the condensate must be deducted for the calculation. This is a difference measurement of steam heat quantity.
Thereby flow, pressure and temperature of the steam need to be recorded in front of the heat exchanger and the temperature of the condensate needs to be recorded after the heat exchanger. The mass of the steam corresponds to the mass of the condensate. The RMC/RMS621 can calculate such differences in steam and heat quantity. Additionally the devices can monitor the steam state and generate a wet steam alarm if required.



Batch controller

Filling process with the batch controller RA33

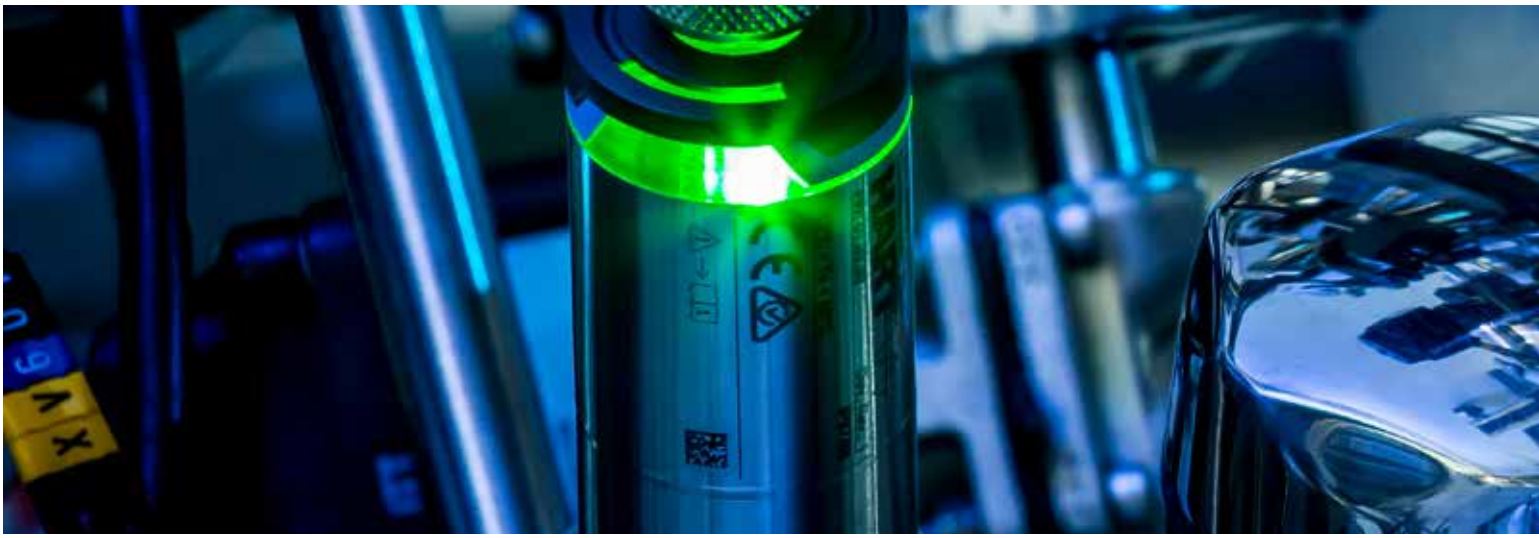
In this application the basic use of the batch controller RA33 is shown. The minimum requirement on filling and dosing applications is the measurement of the flow as well as the possibility for the flow control e.g. through a valve. If only one valve is applied attention has to be paid that the filling time has to be more than 10 seconds. One example for the use of the RA33 is the filling of liquid soaps. Here various substances with pre-defined quantities are dosed into a tank. The batch controller RA33 takes over the exact dosing and documentation of the filled quantity and thus provides the quality proof. The integrated correction of overrun quantity saves resources and reduces costs!



Process indicators for each measurement point

Model	RIA14	RIA15
Features	Loop powered field indicator with pressure encapsulated metal housing (explosion protected according to Ex d)	Loop powered indicator, panel and field version, field housing made of robust aluminum or saltwater-resistant plastic, display of 4 to 20 mA and HART® values, basic settings for Endress+Hauser sensors
Construction		
Display - Number of digits - Height - Type	 5 20.5 mm (0.81 in) LC display, backlit, bargraph	 5 17 mm (0.67 in) LC display, bargraph, backlight can be activated
Power supply	Loop powered 4 to 20 mA	Loop powered 4 to 20 mA
Voltage drop	< 4 V	≤ 1 V for 4 to 20 mA, ≤ 1.9 V for HART® (additional 2.9 V with backlight)
Input - Analog - Digital / HART® - Temperature (RTD, TC)	 1 - -	 1 1 HART® (option) -
Loop power supply	-	-
Signal isolation	-	-
Output - Analog - Digital (OC) - Relay	 - 1 -	 - - -
Software functions	Limit value function	Display of up to 4 HART® values (SV, PV, TV, QV) of one measurement device. Configuration of the following level or analysis sensors: - Micropilot FMR20 - Waterpilot FMX21 - Liquiline CM82
Approvals	ATEX, FM, CSA, IECEx, TIIS, DNV GL, UL	ATEX, FM, CSA, IECEx, DNV GL, NEPSI, JPN Ex
SIL	-	SIL interference freeness
Mounting location	Field	Panel, Field
Dimensions (WxHxD) in mm (in)	132 x 135 x 106 (5.2 x 5.31 x 4.17)	Panel: 96 x 48 x 41.5 (3.78 x 1.89 x 1.69) Field: 131 x 81.5 x 55.5 (5.16 x 3.21 x 2.19)
Description as from page	43	42

RIA16	RIA45	RIA46	RIA452
Loop powered field indicator	Process indicator with control unit in panel mounting for monitoring and displaying analog measurement values	Field indicator with control unit for monitoring and displaying analog measurement values	Process indicator with alternating pump control for panel mounting
			
5 26 mm (1.02 in) LC display, backlit, bargraph	5 17 mm (0.67 in) LC display, backlit, 2-color, bargraph	5 26 mm (1.02 in) LC display, backlit, 2-color, bargraph	5 15 mm (0.59 in) LC display, backlit, 3-color, bargraph
Loop powered 4 to 20 mA	24 to 230 V AC/DC	24 to 230 V AC/DC	90 to 250 V AC 20 to 28 V AC 20 to 36 V DC
< 4 V	-	-	-
1 - -	1/2 - ✔	1/2 - ✔	1 1 digital ✔
-	✔ Ex	✔ Ex	✔ Ex
-	✔ Ex	✔ Ex	✔ Ex
- 1 -	1/2 1 0/2	1/2 1 0/2	1 1 4/8
Limit value function	+, -, mean value, multiplication, linearization, differential pressure, limit value function, overfill protection	+, -, mean value, multiplication, linearization, differential pressure, limit value function, overfill protection	Linearization , integration, limit value function, pump control
ATEX, FM, CSA, IECEx, DNV GL, UL	ATEX, FM, CSA, UL, DNV GL, WHG approval	ATEX, FM, CSA, UL, WHG approval	ATEX, FM, CSA, TIIS,
-	2	2	-
Field	Panel	Field	Panel
199 x 158 x 96 (7.83 x 6.22 x 3.78)	96 x 48 x 152 (3.78 x 1.89 x 5.98)	199 x 160 x 96 (7.83 x 6.3 x 3.78)	96 x 96 x 145 (3.78 x 3.78 x 5.71)
43	43	43	43



Indicators with and without power requirement

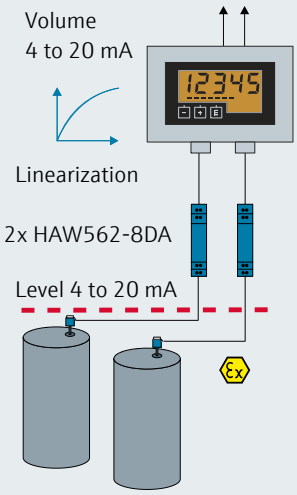
Loop powered indicators

These indicators require no power supply and can be universally used in current measuring circuits. They can be easily installed in intrinsically safe applications.
They are used where measurement values have to be clearly visible or where the display of the measuring device is hard to read due to the installation conditions. They are very convincing because of their high contrast display of process values under all environmental conditions.
Due to not requiring a power supply installation cost savings are made, so that displays that would have been too costly can now be realized. The worldwide certification and various housing versions permit direct installation in Ex-areas.
The RIA15 offers a real added value with the possibility to function as a HART® display. The measurement value is displayed highly accurately and there is the possibility to indicate up to 4 values of a measurement device on one RIA15.
In addition, the RIA15 with HART® can be used to estimate the HART® signal level, the valid communication resistance, and the noise load of the network. Thus, the RIA15 can be used as a simple diagnostic tool for HART® networks.
When used in conjunction with the Micropilot FMR20 radar level sensor, the Waterpilot FMX21 hydrostatic level sensor and the Liquiline CM82 compact analytical sensor, the RIA15 unit can also be used to make the basic settings for the sensors. The RIA15 field housing is also available made from plastic. This makes the indicator saltwater-resistant and ideally suitable for the marine industry and river boats.

Process indicators with control function

Indicators with control function combine several functionalities in one device:
- Active barrier
- Transmitter
- Control unit with relay

These features combined with the brilliant displays offer highest comfort and best functionality on site.
The indicators are available for panel mounting as well as for field mounting.
Operation is easy and intuitive despite the high functionality. The devices can be operated without any problems by using the operating keys on site or by using the PC software FieldCare. Thus enables fast and easy commissioning. Moreover, the devices can be ordered pre-configured.



You gain through

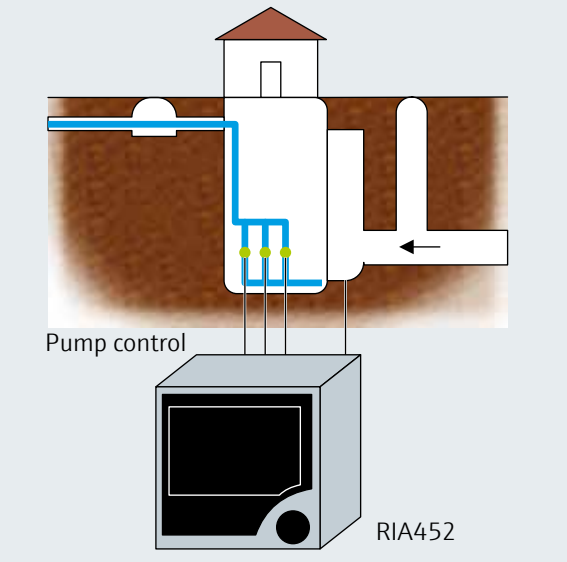
- Excellent price-performance ratio
- Fast, simple and comfortable commissioning and operation
- Very fast delivery and optional customer-specific preset
- Additional security through local measured value display

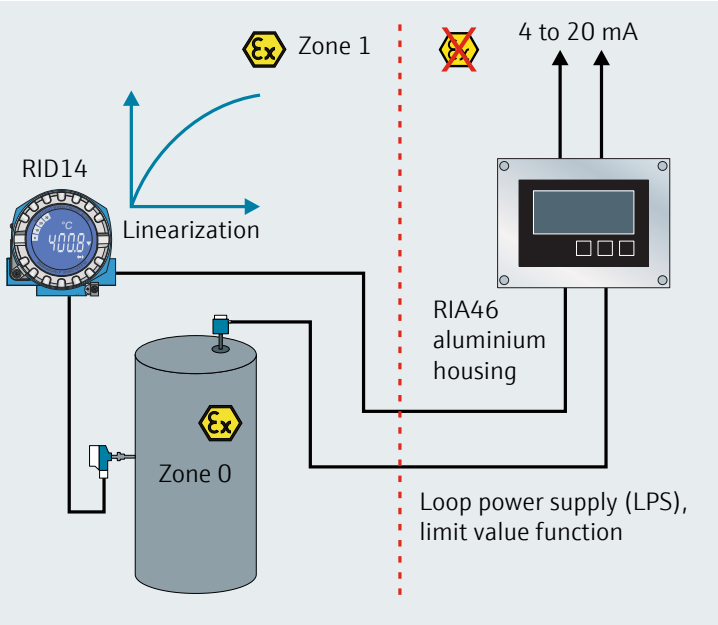
Application examples

Process indicators

Alternating pump control with RIA452

RIA452 is a pump specialist. It offers an alternating pump control which ensures an equal use of several pumps. If the power supply is interrupted not all pumps run at the same time but at staggered intervals. If a pump failure occurs the respective pump is taken out of the control. Thus the pumping station is optimally controlled. Up to 8 pumps can be controlled in parallel.





Separation of Ex-area, linearization, monitoring

To directly display pressure values in zone 1 the devices RIA14 and RIA16 can be used.
In the described application RIA46 provides

- the separation to the Ex-area,
- the power supply of the sensors in the Ex-area and
- the linearization of the filling level and the monitoring of the maximum filling height. Furthermore the temperature limit value is monitored (range, maximum or minimum).

The calculated tank content (volume) as well as the measured temperature are transmitted as 4 to 20 mA signal. A sensor set-up via a HART® Handheld can be done without additionally installing a communication resistance. The communication resistance is already integrated in the RIA45 and RIA46. A comfortable and fast maintenance is possible any time without interrupting the measuring loop.

Fieldbus indicators

Model	RID14	RID16
Features	8-channel field indicator with FOUNDATION Fieldbus™ or PROFIBUS® PA protocol with pressure encapsulated metal housing (explosion protected according to Ex d)	8-channel field indicator with FOUNDATION Fieldbus™ or PROFIBUS® PA protocol
Construction		
Protocol		
Display - Number of digits - Height in mm (in) - Type	5 20.5 (0.81) LC display, backlit, bargraph	5 26 (1.02) LC display, backlit, bargraph
Power supply	Via the fieldbus < 11 mA	Via the fieldbus < 11 mA
Channels	Up to 8	Up to 8
Special features	Listener mode, On FOUNDATION Fieldbus™ also function block connection: Display transducer block, Advanced diagnostic block, 2 x input selector Arithmetic block, Integrator block, PID block	Listener mode, On FOUNDATION Fieldbus™ also function block connection: Display transducer block, Advanced diagnostic block, 2 x input selector Arithmetic block, Integrator block, PID block
Approvals	ATEX, CSA, FM, IECEx	ATEX, CSA, FM, IECEx
Mounting location	Field	Field
Dimensions (WxHxD) in mm (in)	132 x 135 x 106 (5.2 x 5.31 x 4.17)	199 x 158 x 96 (7.83 x 6.22 x 3.78)
Description as from page	45	45

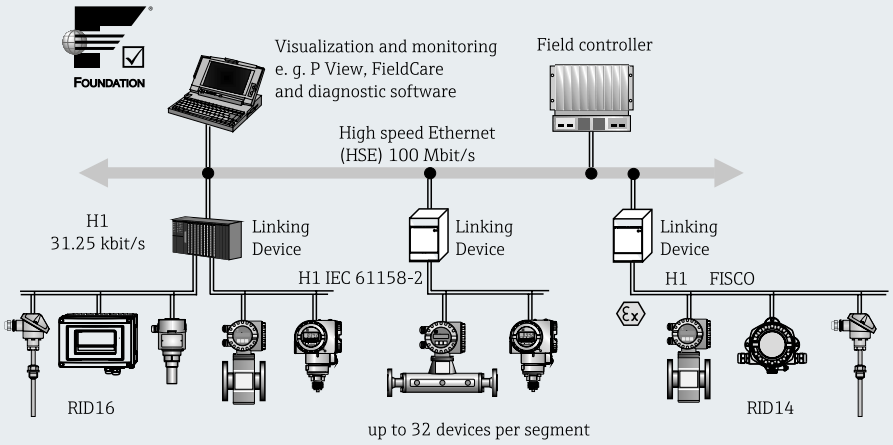
Indicators for integration into fieldbus systems

These indicators support all bus devices and indicate the values communicated on the bus.
The PROFIBUS® PA version of the devices acts as a pure listener without an own device address. The FOUNDATION Fieldbus™ indicators can be operated either in a listener mode or in the standard mode using a function block connection.
A simple and fast set-up is possible via e.g. the configuration software FieldCare or DIP switches.
The devices convince by their high contrast, backlit display of the respective value. The integrated bargraph with over- and under range indication in the RID14 and RID16 offers a swift value overview. Both devices also offer an integrated 14-segment field for plain text or TAG.

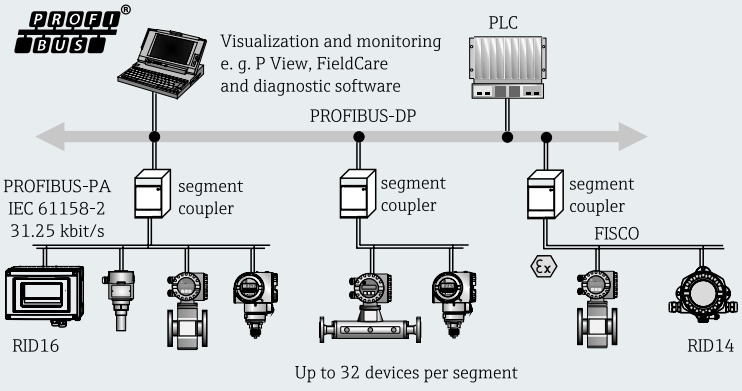
you gain through

- Large display, easily readable at all ambient conditions
- High plant availability through integrated safety functionalities
- Comfortable and easy integration into bus systems
- Service support through diagnosis functions

Example of a FOUNDATION Fieldbus™ connection



Example of a PROFIBUS® PA connection



Interface devices

Model	RMA42	RTA421
Features	Process transmitter with control unit for monitoring and displaying analog measurement values	Limit alarm switch with power supply for monitoring current or voltage signals
Construction		
Loop power supply	1/2x 24 V DC, 30 mA Ex	1x 24 V DC, 30 mA
Signal isolation/barrier	✔ Ex	✔
Power supply	20 to 250 V AC/DC	196 to 250 V AC, 50/60 Hz 90 to 126 V AC, 50/60 Hz 20 to 250 V DC/AC, 50/60 Hz
Input - Analog - Temperature (RTD, TC)	 1/2 1/2	 1 -
Output - Analog - Digital - Relay	 1/2 1 0/2	 - - 2
Software functions	+, -, multiplication, average, linearization, differential pressure, limit value function, overfill protection	-
Approvals	ATEX, FM, CSA, NEPSI, DNV GL, WHG, KTA	-
SIL	2	-
Display	LCD, 5-digit, bargraph, messages and user-defined text	LCD, 4-digit
Interfaces	PC interface, HART® ports	-
Width in mm (in)	45 (1.77)	45 (1.77)
Description as from page	49	-

RN221N	RB223	RNS221
Active barrier with power supply for safe isolation of 4 to 20 mA signal circuits with optional HART® diagnosis	One or two channels, loop powered passive barrier for safe isolation of 4 to 20 mA signal circuits	Transmitter supply for two 2-wire sensors or transmitters
		
1x 24 V DC, 30 mA ⟨Ex⟩	-	1/2x 24 V DC, 30 mA
✔ ⟨Ex⟩	✔ ⟨Ex⟩	✔
20 to 250 V AC/DC	Loop-powered	20 to 250 V AC/DC
- -	- -	- -
1 - 0/1	- - -	2 - -
HART® status monitoring	-	-
ATEX, FM, CSA, JPN Ex, IECEx, DNV GL	ATEX, FM, CSA	-
2	3	-
-	-	-
HART® ports	HART® ports	HART® ports
22.5 (0.89)	22.5 (0.89)	22.5 (0.89)
49	49	-

Interface devices for DIN rail mounting

With our interface devices we pass on our long-standing experience in industrial measurement technology to our customers in the form of hard and software solutions adapted to their respective tasks. The product line includes devices that have been optimized to specific functions such as power supply of sensors up to multifunctional devices with limit value monitoring and SIL2 approval. The interface family covers functions for intrinsically safe applications as well as economic solutions.

Here Endress+Hauser offers a product range to complete your measurement point matched to our own instrumentation.

Easy installation

Easy and fast installation is the focus of devices for DIN rail mounting. Therefore all devices are equipped with plug-on screw terminals. If a HART® device is connected, almost all devices offer HART® communication ports with which the HART® devices can be set up without the need to open the loop for installing the communication resistance. This saves time and money.

SIL Certification

In process industry integrated safety functions are used with increasing frequency. There is also an increasing requirement for safety-oriented interface devices. Endress+Hauser offers devices with SIL2 or SIL3 certification. This means higher safety during use.

Versatile

With extensive equipment the devices offer various application possibilities. This ranges from simple power supply of measurement devices, passive or active barriers or simple limit values to two-channel transmitters with calculation function and limit value relays. Thus the interface devices from Endress+Hauser can be used for many applications.

You gain through

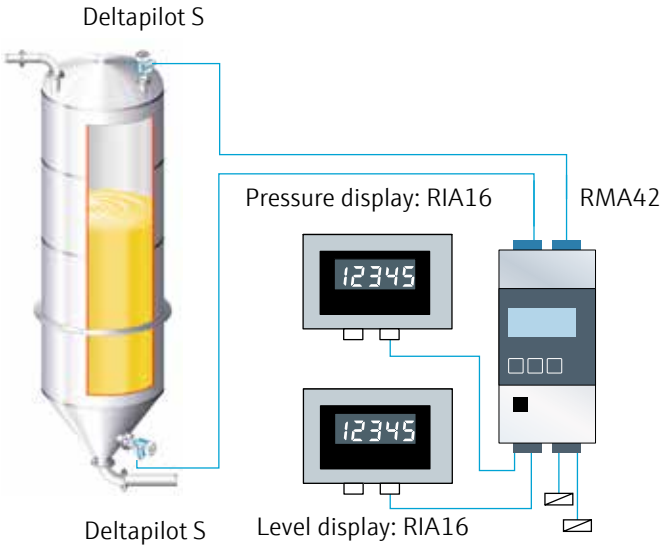
- Functionality designed for your application
- High plant availability due to integrated safety functions and SIL certification
- Multi-channel applications
- Various Ex-approvals
- HART® communication ports
- Plug-on screw terminals

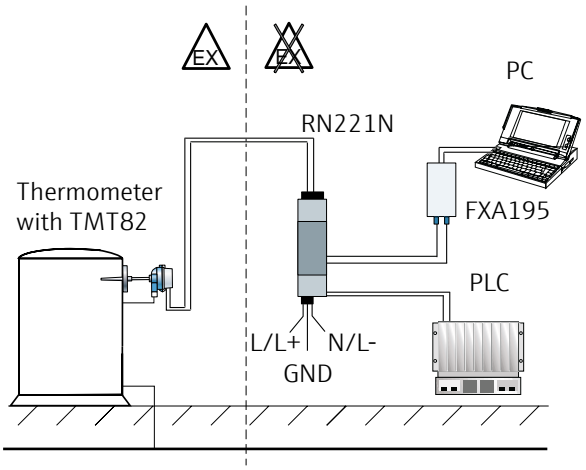
Application examples

Interface devices

Differential pressure measurement with RMA42

The hydrostatic filling level measurement with the Deltapilot S and the RMA42 is ideal for use in pressurized tanks. The devices calculate filling level and volume by using the signals coming from the pressure sensors (one at the bottom and one at the top) of the tank. Additionally, the pressure at the top of the tank is displayed. Thus an effective tank monitoring is possible without complex SPS programming.



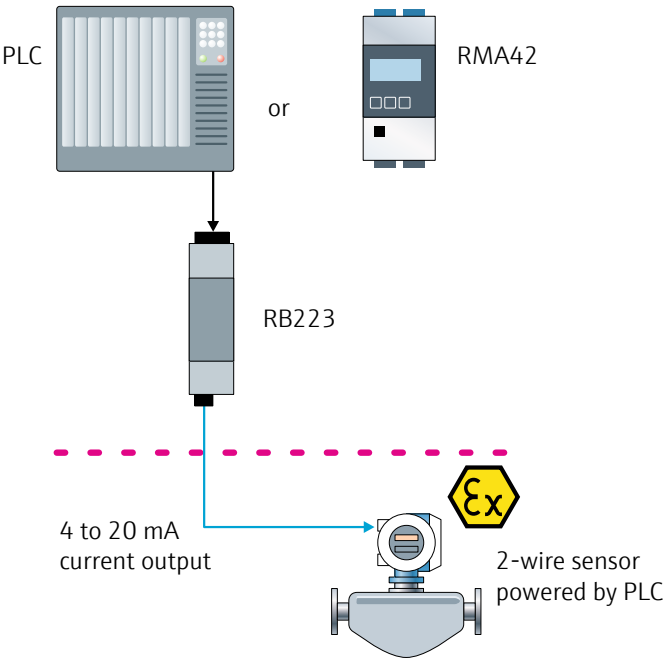


RN221N supply of a temperature measurement point

If a 4 to 20 mA HART® head transmitter TMT82 is installed in a thermometer it has to be supplied with power. The active barrier RN221N supplies the head transmitter with power, if required also in the Ex-area, and then transmits the galvanically isolated signal. With the optionally available HART® monitoring the status of the head transmitter is monitored. If an error arises a relay at the RN221N sends an alarm. The relay has to be actively set back. Thus even just briefly occurring errors can be easily located.

RB223 passive barrier with SPS

If a sensor in the Ex-area is to be supplied via a SPS the use of a barrier is necessary.
The RB223 transmits the supply from the Non-Ex area into the Ex-area and sends back the 4 to 20 mA signal.
The RB223 does not require a power supply as it receives its power from the 4 to 20 mA loop.
The voltage drop is max. 3.5 V at 4 mA.

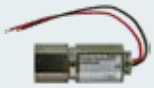


Surge arresters

HAW562 – for DIN rail mounting

Version / order code	HAW562-AAB	HAW562-AAC	HAW562-AAA	HAW562-8DA	HAW562-AAD	HAW562-AAE
Construction						
Application	Surge protection for power supplies		Surge protection for signal cables / communication cables, direct and indirect grounding possible			Surge protection for signal cables
Area / signal	10 to 55 V (+/-20 %)	90 to 230 V (+/-10 %)	4 to 20 mA, HART®, PFM, PA, FF	4 to 20 mA, HART®, PFM, PA, FF	RS485, Modbus, PROFIBUS DP	Protection module Prosonic S
SPD class	Type3 P3		Type1 P1			
Certificates	SIL 2					
Approvals	-	-	-	ATEX/IECEx II2, CSA	-	-
Accessories	Field housing, mounting kit		Field housing, mounting kit, screen grounding clamp			Field housing, mounting kit
Dimensions (WxH) mm (in)	18 x 90 (0.71 x 3.54)	18 x 90 (0.71 x 3.54)	12 x 90 (0.47 x 3.54)	12 x 90 (0.47 x 3.54)	12 x 90 (0.47 x 3.54)	12 x 90 (0.47 x 3.54)

HAW569 – for field mounting

Version / order code	HAW569-AA2B	HAW569-DA2B	HAW569-CB2C
Construction			
Application	Surge protection of signal cables (4 to 20 mA, PFM, HART®, FF, PA)		Surge protection of signal cables (4 to 20 mA, PFM, HART®, FF, PA) and power supply cables (0 to 66 V & 80 to 230 V)
SPD class	Type2 P1		Type2 P2
Installation	Lead through version (direct and indirect screen grounding). Lead-through of power supply / signals - no extra cable gland	Lead through version (direct screen grounding). Lead-through of power supply / signals - no extra cable gland	Screw-in version Parallel connection – no additional resistor in the circuit
Approvals	Non Ex area	ATEX/IECEx, CSA	ATEX/IECEx, CSA
Certificates	SIL 2		
Accessories	M20 / NPT1/2" adapter Cable gland set Grounding washer	M20 / NPT1/2" adapter Cable gland set Grounding washer	M20 / NPT1/2" adapter
Dimensions	SW 27 x 71 mm (AF 27 mm x 2.8 in)	SW 27 x 71 mm (AF 27 mm x 2.8 in)	SW 27 x 63 mm (AF 27 mm x 2.48 in)

Surge arresters

Secure the plant availability

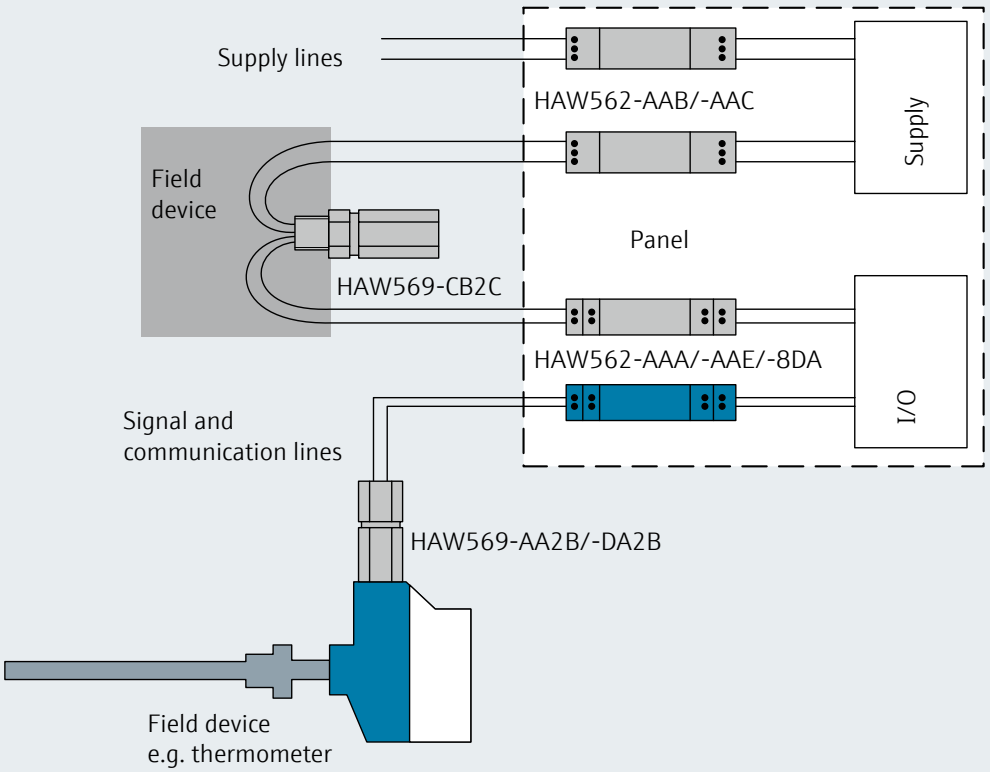
Plant availability is very important as even short failures in production may cause high losses in sales. Therefore respective protection of the devices e.g. surge protection as well as a high availability of plant parts needs to be ensured.

Direct and indirect lightning as well as switching operations within a process can produce voltage overloads into supply lines and communication circuits, such as fieldbus systems. These overloads are rapidly changing impulses, also named transients, which can reach several kilovolts (up to 10 kV) within microseconds.

Even though sensors are tested according to the EMC guidelines (EN 1000-4-5) for these impulses, however, only up to 2 kV on main power lines or 1 kV on signal lines.

This means that overvoltage protection matched to both sensors and process industry requirements is absolutely necessary. The HAW562 and HAW569 devices limit the overloads in both power/supply circuits as well as signal/communication cables to a tolerable value for the sensitive electronics. HAW562 and HAW569 surge arresters have been especially developed for the protection of sensitive measurement electronics and thereby secure plant availability by reducing the excess values in the lightning protection stages and automatic reset after the event.

When installing surge arresters it has to be ensured that both sides of a line are equipped with a surge arrester. Endress+Hauser offers surge arresters for DIN rail mounting in the panel and for direct mounting in a field housing.

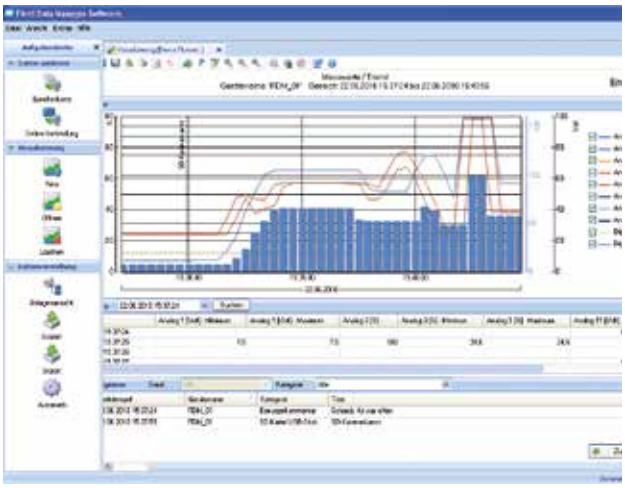


Field Data Manager software MS20/MS21

Data management made easy

The FDM software offers various possibilities to display, manage and archive data from the production process. Data is stored in a data base, thus extensive searching and complicated data handling is avoided.
With the help of the manipulation proof data management the requirements of the legislator and company compliance specifications can be easily fulfilled. Flexible display possibilities support the transparent representation and offer a solid basis for process analysis. This makes the complete data storage of a measurement point possible, e.g.

- Measurements (analog and digital signals, calculated values)
- Event diagnostics
- Protocols
- Online visualization of instantaneous values (“live data”)



Flexibility and safety through SQL data base

Using the FDM software the stored data as well as the device configuration can be read out (automatically) manipulation protected and saved locally, in a network or in an SQL data base. The process data is stored in a secure, efficient and cost effective manner over the complete product life cycle and can be accessed at any time.
A PostgreSQL™ data base (free of charge) which is included in the scope of delivery can be installed and used together with the software. Besides that, FDM is open for other SQL data bases (Oracle™, Microsoft SQL Server™) so that storing can be performed into an already existing data base.
SQL offers a standardized interface to further systems. ERP systems (such as SAP) can directly access the stored measurements and reprocess these.

Automatic/Export & import function

Data are automatically read via an integrated system service. This service allows device data to be read out and stored in the database in parallel with other tasks such as report generation or export and import actions. The import functionality can be used to load planned values into the database in XLS or CSV format. This data can be used to compare planned/actual values for the purpose of energy monitoring.
Furthermore, reports or TrustSens calibration certificates (which were logged in the RSG45 using the TrustSens Calibration Monitoring function) can be automatically saved as a PDF. This is of particular benefit in the pharmaceutical industry. FDA 21 CFR 11 security is guaranteed by the software‘s FDA-compliant audit trail as well as extensive user administration. Restricted access can be granted using various user models. Here, employees are only given access to information that is relevant for their area of responsibility. FDM satisfies the security requirements of the FDA 21 CFR 11 rules as follows:

- Data encryption with tamper detection and marking
- Safe password and access authorization system
- Tamper-proof storage of all access in the audit trail

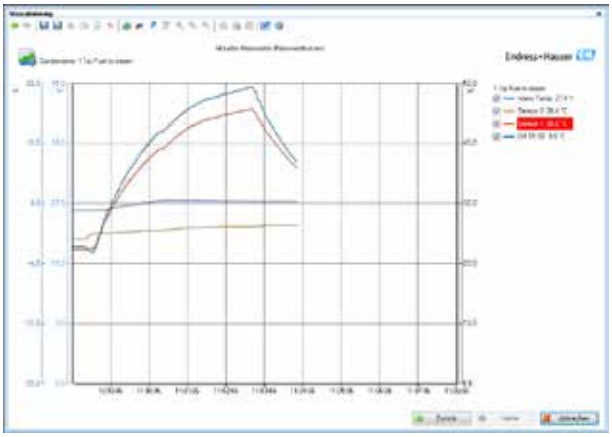
Intuitive user guidance and modern interface

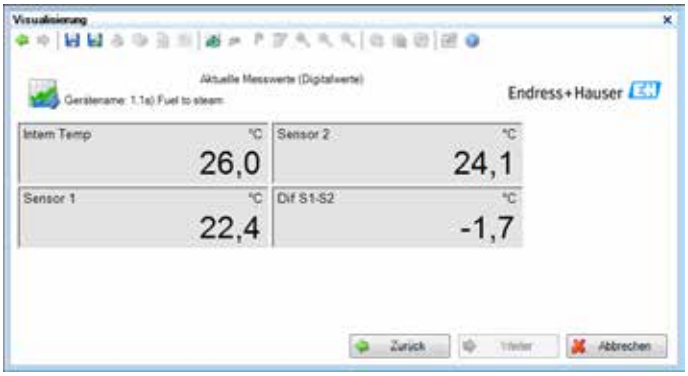
The user is assisted by a wizard through all setting steps and activities. An on-line help function is available for each individual step. Reports that have already been generated can be saved as templates and are therefore available for a later renewed data analysis. Movable, individual action windows make it possible to work simultaneously on several monitors. All sorts of reports as well as tables and graphics can be compared with each other. The FDM software can read out and archive data from the following devices:

- EngyCal RH33, RS33 and batch controller RA33
- Ecograph, Ecograph A/C/T
- Memograph, Memograph M/S
- Sampler with Liquiline CM44x

Visualization of current measured values

In addition to archived data, the current values of a number of devices can be visualized simultaneously in FDM. Up to 40 analog values or 100 digital values can be displayed in measured value curves, as a bar graph or digital value. A mixture of display modes is also possible in different windows that can be positioned as required. The channel name and configured measuring range are shown for all display modes in addition to the current value and the unit. The affected channel is indicated appropriately in the event of a limit value violation. All of this information provides a quick and detailed overview of the process.





Trial version

You can test the FDM software without obligation. We offer a trial version which can be used for 60 days free-of-charge.

Licence model

MS20 single-user license: Software installation on one computer at the same time.
MS21 multi-user license (floating licenses): Multiple users simultaneously depending on the number of available licenses.

Order number for detailed technical information:
TI01022R

You find the current software version on the Interent:
www.endress.com/ms20
www.endress.com/ms21

OPC server

Visualization, monitoring and control of processes

Today OPC stands for 'Openness, Productivity and Collaboration' and is an interface standard in factory and process automation.

Based on Windows technology OPC enables a simple and standardized data exchange between engineering processes and process monitoring and control. Today higher and higher requirements on the availability, productivity and quality are made in all areas of automation technology. The integration of hundreds of devices from different manufacturers is, in this case, the greatest challenge. The integration of these measurement points into primary, central visualization and control systems takes a lot of time and money.

Use a standardized technology like OPC to integrate measuring points and express process data in a simple and fast way. The Endress+Hauser OPC Server is a comprehensive tool for all Endress+Hauser recorders, data managers and energy managers, that are equipped with a serial and/or Ethernet interface.

Simple data exchange

Depending on the type of device, data access to the following instantaneous values is possible:

- Analog channels
- Digital channels (digital combination)
- Mathematics channels and calculated process values
- Totalizer
- Time synchronization
- Date/time
- Calculated process values
- Quantities and energy

Test version

You can test the OPC server without obligation. We offer a trial version which can be used free of charge for 30 days.

Order number for detailed technical information:
TI00122R

You find the current software version of the OPC server on the Internet:
www.endress.com/rxo20

Compatibility list	Communication
▪ Ecograph T ▪ Memograph M, Memograph S	RS232/RS485 Ethernet TCP/IP
▪ Alphalog	RS232/RS485
▪ Steam and heat manager RMS621 ▪ Energy manager RMC621 ▪ Energy manager RH33, Steam calculator RS33	RS232/RS485 Ethernet TCP/IP (RS232 adapter) Ethernet TCP/IP
▪ Application manager RMM621 ▪ Batch controller RA33	RS232/RS485, Ethernet TCP/IP Ethernet TCP/IP

Your notes:

Further information:

- Level measurement FA00001F
- Pressure measurement FA00004P
- Flow measurements for liquids, gases and steam FA00005D
- Temperature measurement FA00006T
- pH measuring technology FA00007C
- Analyzers for water and wastewater FA00012C
- Service KOMPAKT FA00018H

Or alternatively as download under:
www.endress.com/download

Have you found "Your" device?
We would be pleased to send you further detailed Technical Information.

www.addresses.endress.com

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