System Components and Data Managers
Solutions for the loop

System Components and Data Managers

Endress+Hauser

People for Process Automation

Complete solutions with system components

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Endress+Hauser is a global supplier of products and solutions for the process industries.
We develop sensors, transmitters and systems that reliably record, transmit and process critical plant information to optimize your process control.

International and always available

Endress+Hauser is a leading international manufacturer of industrial process automation solutions with production and development facilities in the USA, Europe and Asia. The excellent price/performance ratio of our products and services provide the highest quality, reliability and security. With sales offices and representatives in over 100 countries we are always at your service to assist you in the selection of the best components to suit your application.

Designed for safety and plant availability

All our products and components are designed for simple installation and user friendliness. We also pride ourselves in protecting both resources and environment.
In addition to our broad product basket, industrial and project engineering services are also available. Endress+Hauser offers effective expansions or stand alone solutions for your measurement points, operating to international standards and approvals.

- Paperless recorders / data managers
- Energy managers
- Application managers
- Process indicators for both field and panel mounting
- Active barriers and power supplies
- Process transmitters
- Surge arresters

Competence in monitoring, visualizing and archiving your measurement point

Everything from one source

System components are necessary in order to be able to ensure that measurements such as energy supply and sensor monitoring comply with international industrial standards and regulations.

Endress+Hauser's range of system components not only covers these basic requirements but also increases plant availability via proactive diagnostic information. They also optimize processes by direct front-end control or measure energy usage with tested calculation methods.

In the fields of data managers and paperless recorders which are necessary for secure recording and storage of process data, Endress+Hauser offers universally usable basic devices as well as special branch and application solutions.

These days the requirements on measurement technology go far beyond the mere recording of measurement values.

Thus the measuring devices are to be supplied with power and protected, the measurement value displayed or processed, alarm set points derived and monitored as well as data securely recorded. These tasks are covered by the system components and recorders from Endress+Hauser.

No matter what industry, Endress+Hauser can provide your solution with the most suitable products and the necessary approvals such as SIL or intrinsically safe to, FM, CSA, ATEX, TIIS or NEPSI.

Innovative and fast

The focus lies on easy installation and fast commissioning. This applies for simple devices such as active barriers as well as for multifunctional devices such as the Memograph M. Thus the manifold functions can be adapted to the application requirements through simple parameterization.

Furthermore, there is a variety of combination possibilities due to various fieldbus systems and interfaces as well as extensive software concepts such as the Field Data Manager software. This saves time and money.

Verified quality

Quality comes first for products from Endress+Hauser. Not only are the ISO 9001 regulations complied with but quality is also continuously monitored during production by testing single components as well as finished devices.

That the products, development and production comply with the highest international requirements was confirmed with the company being awarded various quality awards.

System components from Endress+Hauser
You profit by:
- Excellent price/performance ratio
- Fast return on investment
- High plant availability
- Minimum maintenance costs
- Easy and fast operation
- International approvals
- Integration into various bus systems
- Safe and manipulation-safe data handling
- Optimal complement for Endress+Hauser measurement devices

A recorder for every application
... All versions at a glance

Model	Minilog B - RDL10
Features	Data logger with 2 input channels for recording and storing analog and digital values.
Construction	
Universal analog inputs	1
Digital inputs	1
Analog outputs	-
Loop power supply	-
Count inputs (impulse)/operating time counter	Yes
Event input	Yes
Alarm set points/relays	2 per channel/-
Measured value display	7 digit LCD
Signal analysis	Intermediate, total report
Process screen	-
E-mail functions Integrated Web Server CSV file format OPC server	Via ReadWin® 2000 - Via ReadWin 2000 -
Mathematics function Integration Calculation factor for integrated quantities Batch function Tele-alarm function Wastewater & storm overflow function Energy software (water + steam)	- - - - Yes - -
Text input	-
Search function (events and values)	-
Memory	Internal
Scan rate	1 s
Interfaces	RS232
Power supply	Lithium battery, or external supply 7 to 30 V DC
Protection class	NEMA4/IP65
Dimensions : WxHxD in inches (mm)	3.94 x 3.94 x 2.4 (100 x 100 x 61)
Pasteurization approval	-
FDA 21 CFR 11	-
User administration	-
Device description	Page 6
Order number for detailed technical information	TI00089R

Ecograph T - RSG35	Memograph M - RSG40
Universal Graphic Data Manager with up to 12 universal inputs. Display, recording and monitoring device with excellent price/performance ratio.	Advanced Graphic Data Manager with universal use of analog and digital signals. Stores, visualizes, analyzes and communicates. Various interfaces, PROFIBUS® DP, Modbus, and Ethernet connection.
0/4/8/12	0/4/8/12/16/20 or up to 40 with Fieldbus
6	6 or 14
-	2
1 x 24 V DC, max. 250 mA	1 x 24 V DC, max. 300 mA
Yes	Yes
Yes	Yes
30 / 6 relays	100 / 6 or 12 relays
TFT color graphic, 5.7 in (145 mm) Resolution: 640 x 480 pixel	TFT color graphic, 7 in (178 mm) Resolution: 800 x 480 pixel
Intermediate, daily, monthly, yearly reports	Intermediate, daily, weekly, monthly, total/yearly reports
-	Up to 10
Yes Yes Yes (direct) Yes	Via ReadWin 2000 or with Tele-Alarm packages Yes Yes (direct) Yes
4 mathematics channels optional optional - - - -	8/12 mathematics channels optional optional optional optional optional optional
-	30x presettable
Yes	Yes
Internal memory + SD card + USB stick	Internal memory + SD card + USB stick
100 ms	100 ms
USB (front) Ethernet (back), RS232/RS485 (optional), Modbus® RTU/TCP Slave (optional)	USB (front) RS232/RS485, PROFIBUS DP Slave, Modbus RTU/TCP Slave, Modbus RTU Master, Ethernet, USB (back)
90 to 250 V AC 24 V AC/DC	90 to 250 V AC 24 V AC/DC
NEMA4 /IP65 (front)	NEMA4 /IP65 (front)
5.67 x 5.67 x 6.22 (144 x 144 x 158)	7.48 x 5.67 x 6.22 (190 x 144 x 158)
-	Yes
-	Yes
-	Yes
Page 8	Page 10
TI01079R	TI133R

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 NEMA4/IP65 field housing
- 7 to 30 V DC power supply or internal battery operation
- RS232 interface for data exchange and direct setup using a PC or modem connection
- ReadWin 2000 for device setup 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 it can also be supplied for use with an external power source in fixed installations or modem operation.

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 setup 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 setup parameters
- Data export to spreadsheet programs (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.

Four 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 graphic 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 manipulation-safe data.

With its universal analog inputs, up to 12 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 4 optional mathematics channels. The device can make individual calculations which can be simply entered using a formula editor.

An all-around package

Furthermore the Ecograph T stands out with its intuitive operation. The parameter setup of the video graphic recorder can be carried out simply 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.

The recorded data can be selected, saved and visualized manipulation-safe 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 easy 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

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

✓ Advantages of the Ecograph T:

- Versatile: Up to 12 universal inputs of the most common measurement signals
- Clear: 5.7 in. 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 space and money
- Simple: Intuitive operation via navigator and user-friendly parameter setup using an integrated web server or FieldCare®
- Safe: Reliable archiving 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
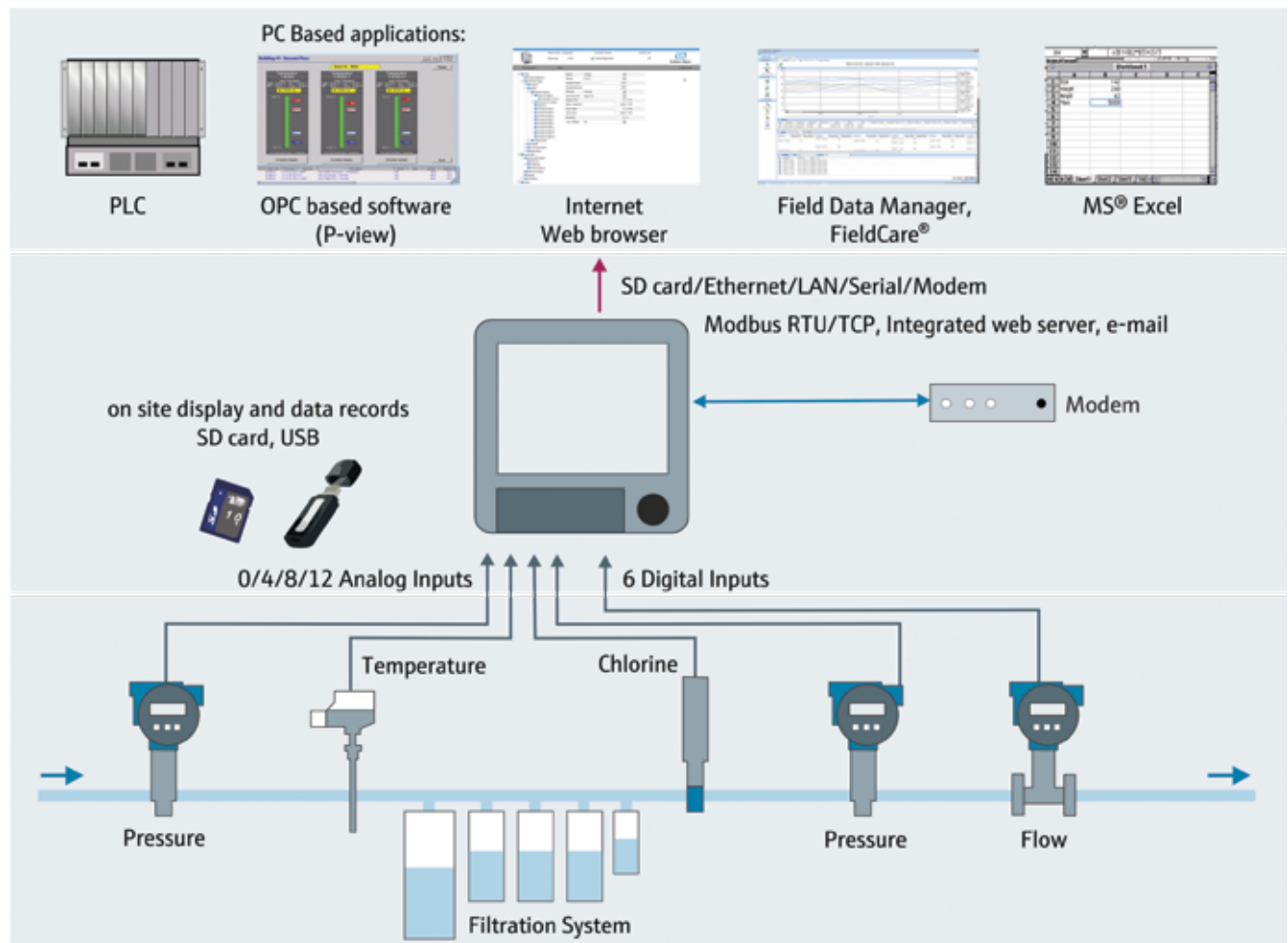
System overview: Application example of a filtration system

Memograph M
Advanced graphic data manager

The versatile solution with secure data recording, visualization and application-specific software packages

More than just a videographic recorder

The Graphic Data Manager Memograph M perfectly controls secure data recording. The innovative device is impressive because of its high functionality, modular construction and its intuitive operator concept. With its brilliant 7 in. TFT display it is possible to display process values as curves, as a circular chart display or as an application-specific process screen. Up to 20 analog and up to 14 digital inputs make the device versatile and enable it to record and document entire machine sequences or processes. With the optional mathematics package eight additional channels are available with which calculations can be made and the channels can be mathematically combined. The mathematics channels can be set up via a formula editor and can also calculate complicated equations.

Up to 100 alarm limit set points can be allocated to the channels. Limit violations are documented and can be output via individual relays. For complex applications the alarm limit set points can be activated and deactivated via a digital input.
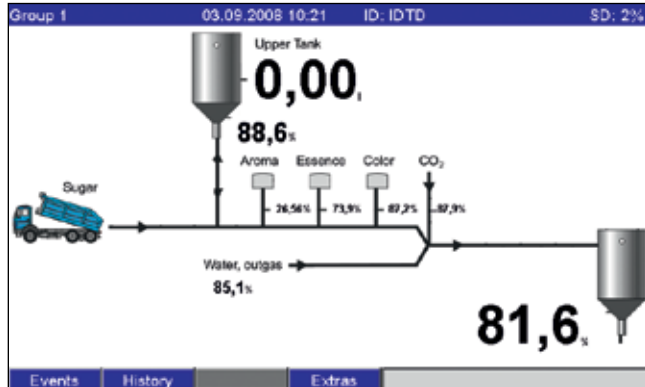
Memograph M is also versatile in terms of communication and system integration. It offers standard protocols and interfaces such as USB, RS232 and Ethernet, but can also be used as PROFIBUS DP slave, Modbus RTU/TCP slave and Modbus RTU master. Up to 40 analog and 14 digital signals can be processed via fieldbus. The fieldbus interface is bidirectional so that input signals or mathematics values can, for example, be transmitted to a PLC using the fieldbus.

The Memograph M offer is completed with specific application packages such as batch, tele-alarm, wastewater or energy.

Memograph M is no longer just a videographic recorder but a versatile solution which is easy to set up and with no need for programming.

Memograph M

Visualization

Process screen with digital measured values

Process visualization made easy

Memograph M optimally meets the requirement to recognize the plant status at a glance with its display of a process screen with digital measured values. 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.


Event log / audit trail

☑ Advantages with Memograph M

- Brilliant:
  7 in TFT display as a front end display for optimum readability
- Fast:
  100 ms scan rate for all channels, high speed memory cycle of 100 ms
- 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 i.e. instrument, process screen 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:
  6.22 in (158 mm) installation depth, NEMA4, IP65 front bezel; operation via external USB keyboard, printout via USB printer
- Concise:
  Alarm management with all active, acknowledged and historical alarms
- Comfortable:
  Re-calibration of a measurement chain can be done in an installed system
- Simple:
  Quick operation and data search with jog/shuttle navigator

Memograph M

System integration and communication
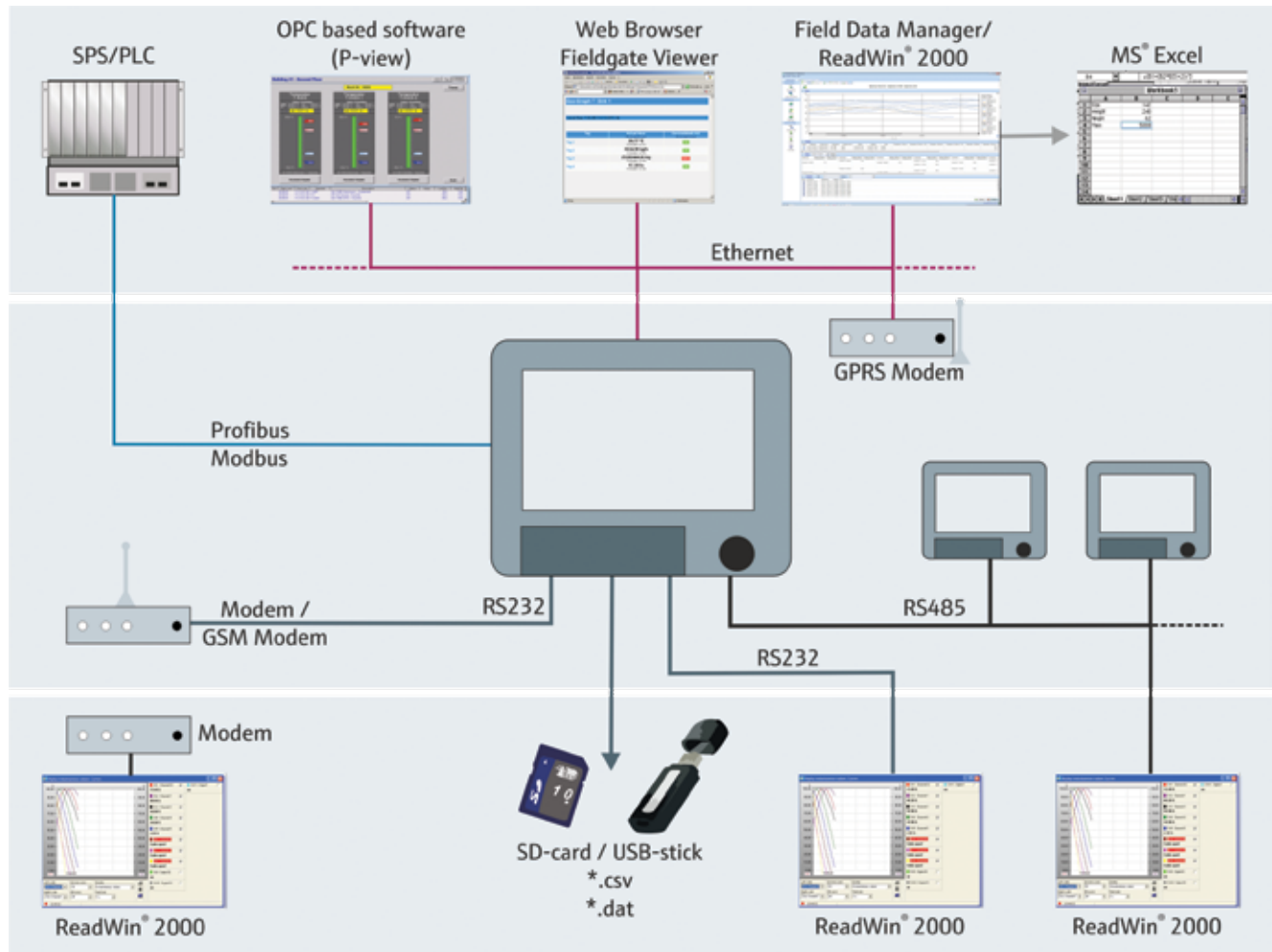
Automatic signal evaluation

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.

Fieldbus communication and system integration

The Memograph M can be easily connected to superior systems. With its optional function Modbus RTU the Master Memograph M offers the possibility of building up an independent bus system without the need for expensive additional components. As a Modbus RTU Master the Memograph M can independently read out up to 40 analog and up to 14 digital sensor inputs and can therefore replace an SPS/PLC.

The Memograph M is available as slave for PROFIBUS DP or Modbus RTU/TCP (optional). In this version analog and digital signals are transmitted bidirectionally so that all input and mathematics signals can be transmitted to a superior system. In all these field bus systems up to 40 analog and up to 14 digital signals can be transmitted and then stored in the Memograph M.

Intelligent videographic recorder

Calculate and solve tasks

FDA 21 CFR 11 compliant data recording

Especially in the pharmaceutical industry an FDA 21 CFR 11 compliant data recording system is required. By fulfilling this requirement, electronic signatures are given an identical legal status as traditional hand written signatures.

The Memograph M already provides an FDA compliant data recording and user administration which can be activated on request.

This includes

- Integrated user and rights management
- ID + password = electronic signature
- Mechanisms that request the user to change his password regularly
- Access protection
- Access block on entry of 3 invalid login attempts

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 Microsoft Excel.

Moreover, integration or a 32 point linearization is possible for each channel.

Easy front-end operation or using PC software

Operation of the device is dialog-based via menus, using a navigator (jog-shuttle) in combination with 4 operating buttons. Alternatively Memograph M can be operated using an external keyboard (USB). Another highlight is the integrated on-line help.

Setup and operation of the device is also possible via the ReadWin 2000 or Field Data Manager PC software. Here the setup is made easy by using the same menu structure and design as directly on the device.

Memograph M

Application packages

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.
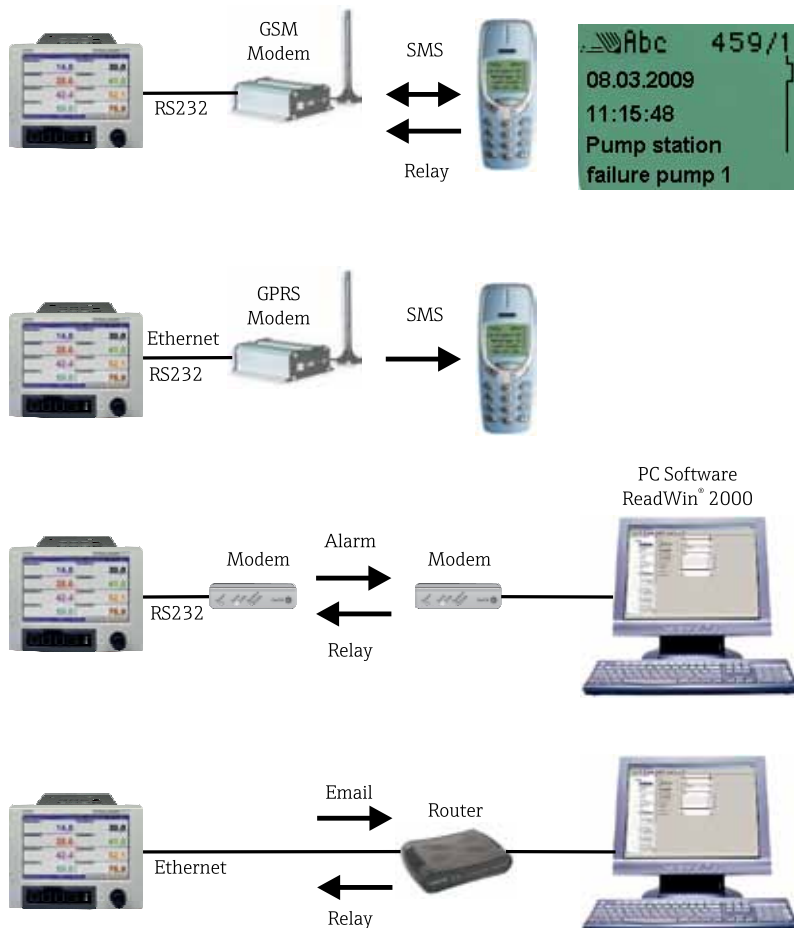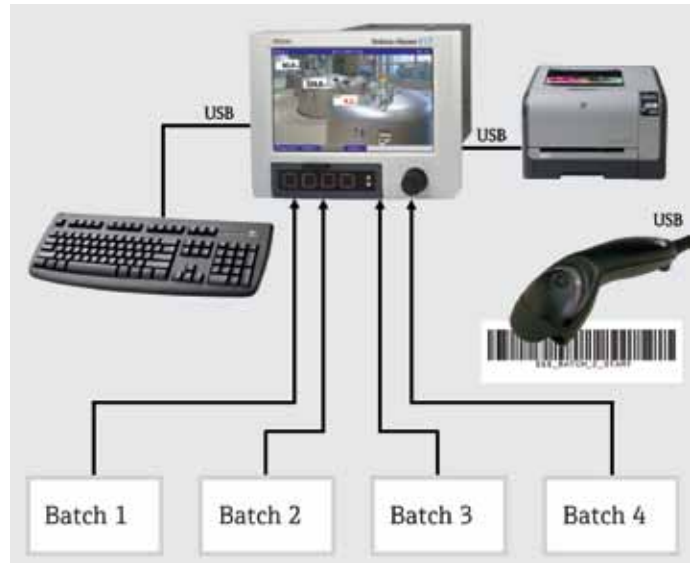

Tele-alarm
Plant remote monitoring and control

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 additional personnel 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, for example plants or pumps can be re-started. This enables full control over the plant without additional tools!
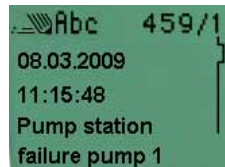
Memograph M

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 (i.e. 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

Together with the Field Data Manager software, fast and cost-effective energy reports can be easily created.

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

Additionally data can be transmitted to operating log books via OPC-Server. 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!
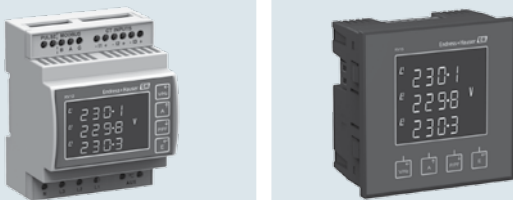
Energy and application managers
Overview

Model	EngyCal® RH33	EngyCal RS33	RSG40
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	Memograph M with energy package offers the possibility of calculating the mass and energy flow 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, UL, PTB type approval	CSA GP, UL	CSA GP, UL, Pasteurization approval, 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, Ethernet TCP/IP, Modbus TCP, PROFIBUS® DP, Modbus® RTU
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	24 V, max. 300 mA
Protection class	IP65	IP65	NEMA 4 /IP65 (front)
Dimensions WxHxD in inches (mm)	5.67 x 6.89 x 5.43 (144 x 175 x 138)	5.67 x 6.89 x 5.43 (144 x 175 x 138)	7.69 x 5.87 x 8.94 (195 x 149 x 227)
Device description	Pages 20, 22	Page 20	Page 10
Technical information	TI00151K	TI00154K	TI00133R

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, UL	OIML R75, ATEX, CSA, FM, UL	CSA GP, UL
1x RS232, 2x RS485, PROFIBUS, M-Bus, Modbus	1x RS232, 2x RS485, PROFIBUS, 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
NEMA 1/IP20	NEMA 1/IP20	IP65
5.31 x 4.25 x 4.49 (135 x 108 x 114)	5.31 x 4.25 x 4.49 (135 x 108 x 114)	5.67 x 6.89 x 5.43 (144 x 175 x 138)
Pages 20, 22	Pages 20, 22	Pages 19, 23
TI00092R	TI00098R	TI00163K

Multifunctional electrical energy meters
Overview

Model	EngyVolt RV12	EngyVolt RV15
Features	Multi-functional electrical energy meter for use in single-phase and three-phase power systems	
Construction		
Software functions	Measuring voltage, frequency, current, power, as well as imported and exported active and reactive power	
Nominal voltage	100 to 289 V AC L-N 173 to 500 V AC L-L	
Nominal current (secondary)	5 A AC RMS	
Measuring range secondary current	0.05 to 6 A	
Nominal power (secondary)	1445 W (3-phase 4325 W)	
Output Pulse output	1	max. 2
Communication	Modbus RTU	
Installation location	Top-hat rail	Panel
Protection class	IP30	IP52 front IP30 back
Dimensions WxHxD in inches (mm)	2.81 x 3.56 x 2.28 basic device (71.3 x 90.5 x 58)	3.78 x 3.78 x 2.28 basic device (96 x 96 x 58)
Description	Page 21	Page 21
Technical Information	TI01025K	

Extension modules for pulse output and Modbus / pulse output for the EngyVolt RV15

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 additional filling process and is then continuously corrected. Thus even continuous changes due to valve aging or deposits in the piping system, for example, 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 setup 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 in 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.

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 can be 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 EngyCal RH33 and RS33 these values can be recorded as the load curve (e.g. with 15) minutes mean values.

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 68°F (20°C) the error also comes from the flow measurement, in case of differences of less than 68°F (20°C) the error mainly results from the temperature measurement. In order to minimize errors in differences of less than 68°F (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. Or, 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.
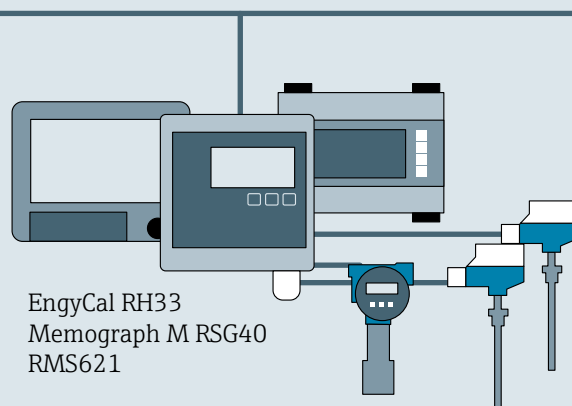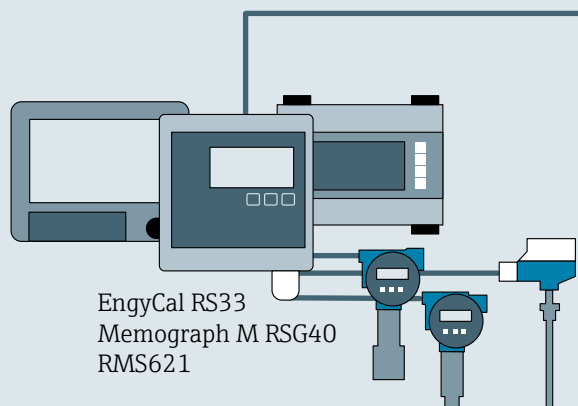
Steam
Flow, pressure, temperature

Fluids -
Heating & cooling
Flow, 2x temperature

EngyCal RS33
Memograph M RSG40
RMS621

EngyCal RH33
Memograph M RSG40
RMS621

Multifunctional electrical energy meters

EngyVolt RV12 and RV15

Reduction of the energy consumption is principally carried out for reasons of resources and environmental protection. However, in the last few years energy has become an essential cost factor in most companies. In order to get a grip on these energy costs, it is very important for many companies to occupy themselves with the energy management topic in order to continuously optimize their energy consumption in the long term.

For the recording of electrical energy values, the energy meters RV12 and RV15 are available. The devices record, display and transmit the most meaningful electrical measuring values in low voltage systems. EngyVolt measures current (A), voltage (V) as well as frequency (Hz) and calculates active (W), reactive (var) and apparent power (VA), power factor, active (Wh) and reactive energy (kVArh) as well as the total harmonic distortion (THD %). In addition EngyVolt RV12 determines the imported as well as exported active and reactive energy.
The two devices are exclusively conceived for use with external current transformers and are suitable for

application in one-phase two-wire systems as well as in three-phase systems with three or four wires.

With EngyVolt a complete energy solution from one source is possible. The energy solutions offered by Endress+Hauser comprise the measurement devices, the software required for evaluation of data and generation of reports and analyses as well as consulting for the optimization of energy efficiency for all forms of energy, the so-called W.A.G.E.S. (Water, compressed Air, Gas, Electricity and Steam).
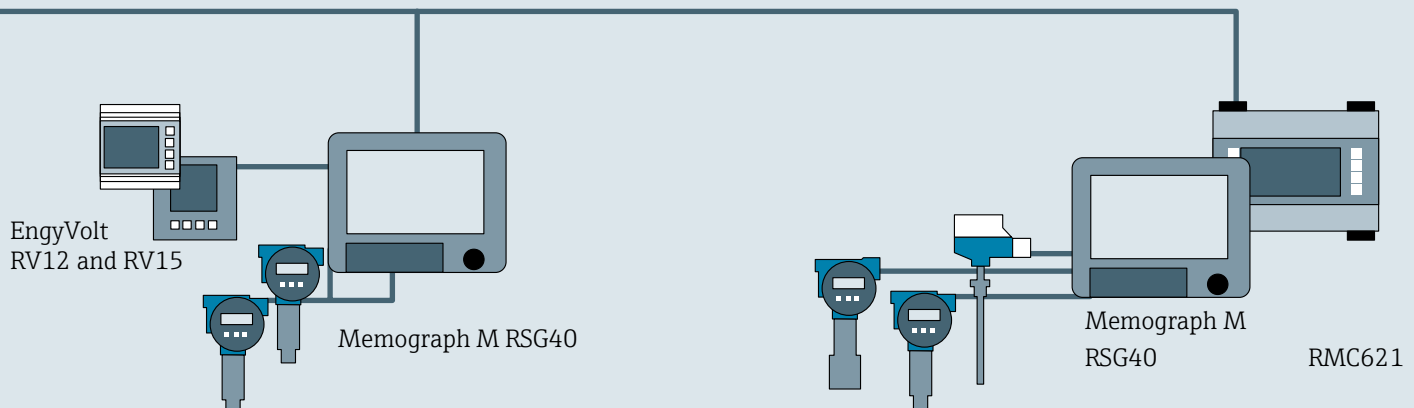
Field Data Manager
Software
Visualization &
manipulation-safe data
storage
or
eSight Energy Software

Compressed air
Differential pressure monitoring in pipe networks and segments of the distribution system, electricity

Gas
Flow, pressure, temperature

EngyVolt
RV12 and RV15

Memograph M RSG40

Memograph M
RSG40   RMC621

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 is the case with the classic paired sensors. Only one sensor has to be exchanged. This saves time and costs!
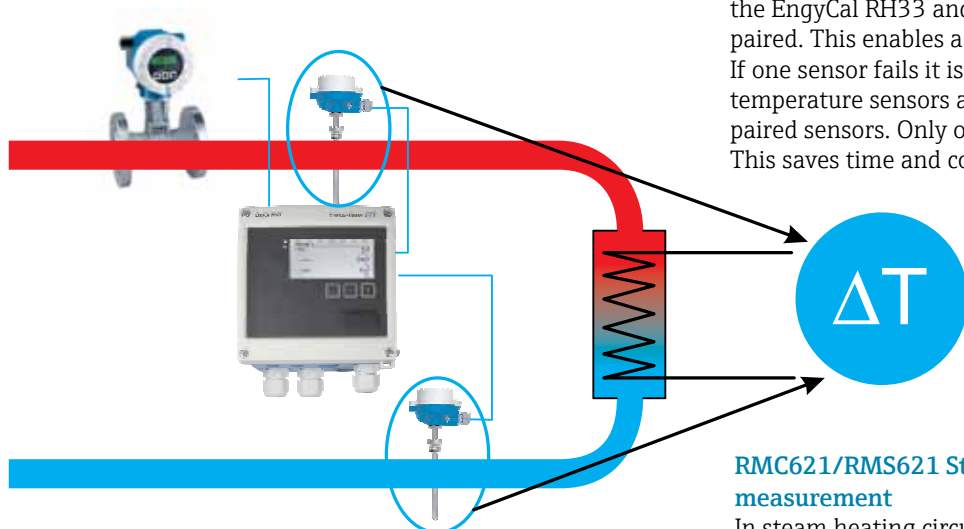
RMC621/RMS621 Steam and heat difference measurement

In steam heating circuits it happens that a part of the steam condenses in the heat exchanger and thus loses part of its heat quantity. In order to correctly measure the energy content of the steam, the energy of this condensate has to be subtracted. 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.
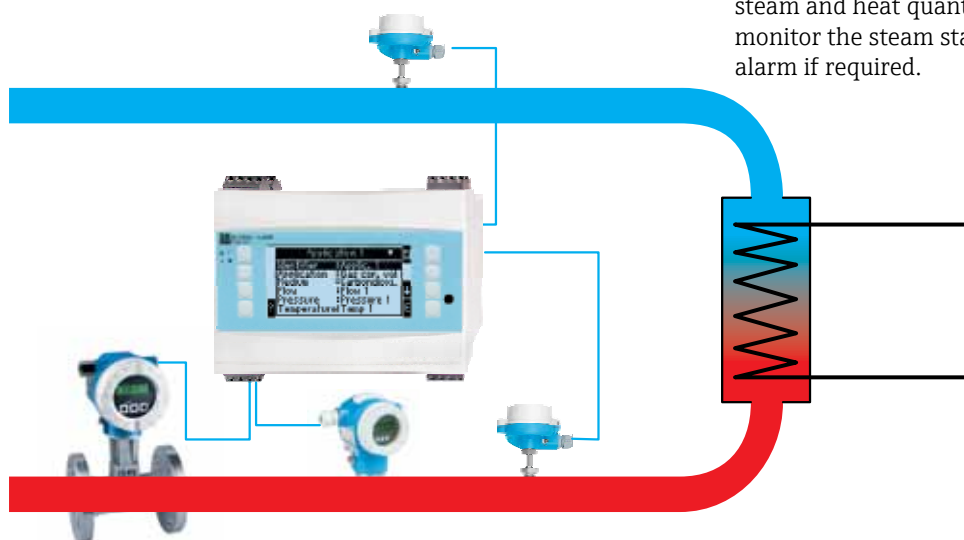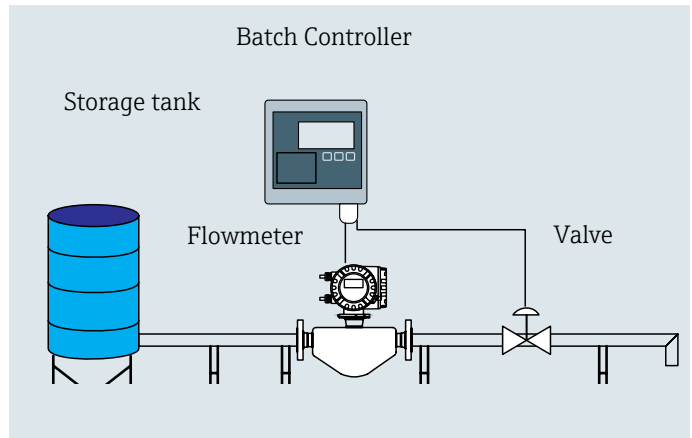
Batch controller

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, 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 ... All versions at a glance

Model	RIA14	RIA15
Features	Loop powered field indicator with pressure encapsulated metal housing (explosion protected according to Ex d (flame proof))	Loop powered indicator, panel and field version, display of HART® values
Construction		
Display - Number of digits - Height - Type	5 0.81 in (20.5 mm) LC display, backlit, bargraph	5 0.67 in (17 mm) LC display, bargraph
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 - Temperature (RTD, TC)	1 - -	1 - -
Loop power supply	-	-
Signal isolation	-	-
Output - Analog - Digital (OC) - Relay	- 1 -	- - -
Software functions	Limit value function	HART indicator; primary or secondary HART Master, Display of up to 4 HART values (SV, PV, TV, QV) of one measurement device
Approvals	ATEX, FM, CSA, TIIS	ATEX. FM, CSA, IECEx, GL SIL interference freeness
SIL	-	-
Mounting location	Field	Panel, Field
Dimensions WxHxD in inches (mm)	5.2 x 5.31 x 4.17 (132 x 135 x 106)	Panel: 3.78 x 1.89 x 1.69 (96 x 48 x 41.5) Field: 5.16 x 3.21 x 2.19 (131 x 81.5 x 55.5)
Description	Page 26	Page 26
Technical information	TI00143R	TI01043K

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 1.02 in (26 mm) LC display, backlit, bargraph	5 0.67 in (17 mm) LC display, backlit, 2-color, bargraph	5 0.67 in (17 mm) LC display, backlit, 2-color, bargraph	5 0.59 in (15 mm) 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 ✔ ✔
-	✔ ⟨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, GL	ATEX, FM, CSA, UL, CSA GP, GL, WHG approval	ATEX, FM, CSA, UL, CSA GP, WHG approval	ATEX, FM, CSA, UL, CSA GP
-	2	2	-
Field	Panel	Field	Panel
7.83 x 6.22 x 3.78 (199 x 158 x 96)	3.78 x 1.89 x 5.98 (96 x 48 x 152)	7.83 x 6.3 x 3.78 (199 x 160 x 96)	3.78 x 3.78 x 5.71 (96 x 96 x 145)
Page 26	Page 26	Page 26	Page 26
TI00144R	TI00141R	TI00142R	TI00113K

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; displays that would have been too costly can now be realized. The worldwide certification and various housing versions permit direct installation in Ex (hazardous)-areas.
The RIA15 offers a real added value with the possibility to function as a HART display. The measurement value is

accurately displayed 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.

✓ 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
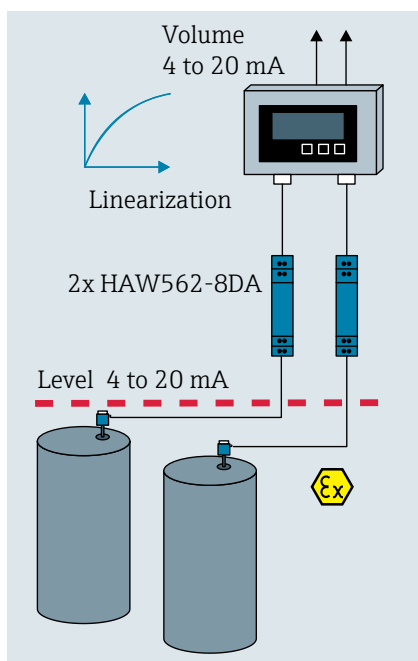
Process indicators with control function

Indicators with control function combine several functionalities in one device:

- Active barrier
- Transmitter
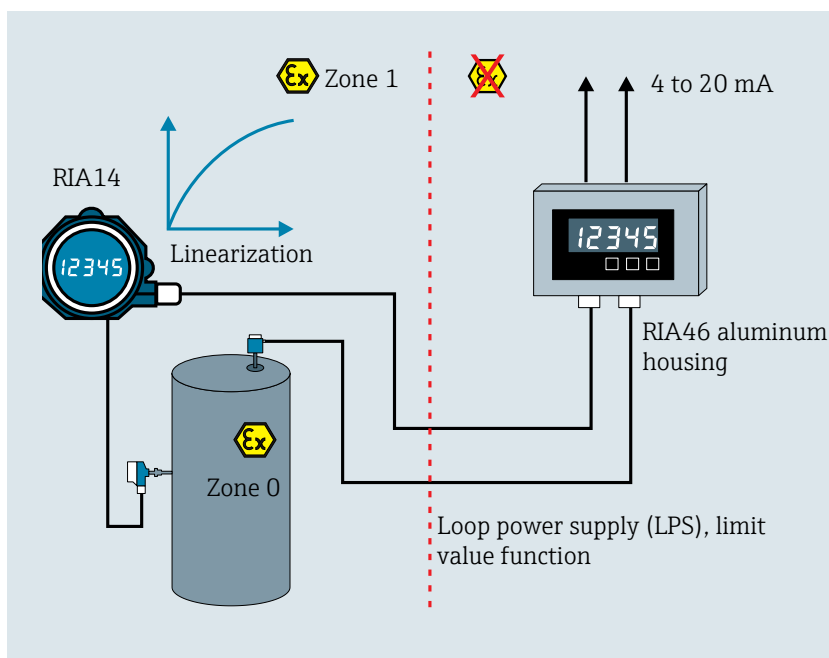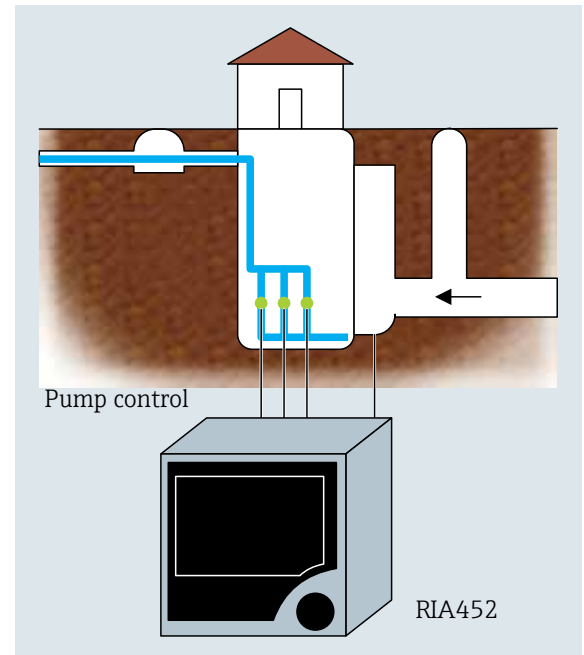- Control unit with relay

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. This enables fast and easy commissioning. The devices can be ordered pre-configured.

Volume
4 to 20 mA

Linearization

2x HAW562-8DA

Level 4 to 20 mA

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.

Pump control

RIA452

Zone 1

4 to 20 mA

RIA14

Linearization

RIA46 aluminum housing

Zone 0

Loop power supply (LPS), limit value function

Separation of Ex-area (hazardous 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 (hazardous) areas,
- the power supply of the sensors in the Ex (hazardous)-areas 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 4-20 mA signals. A sensor setup via a HART Handheld can be done without 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
... Devices at a glance

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 (flame proof)	8-channel field indicator with FOUNDATION Fieldbus or PROFIBUS PA protocol
Construction		
Protocol		
Display - Number of digits - Height in inches (mm) - Type	5 0.81 (20.5) LC display, backlit, bargraph	5 1.02 (26) 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, UL	ATEX, CSA, FM, UL
Mounting location	Field	Field
Dimensions WxHxD in inches (mm)	5.2 x 5.31 x 4.17 (132 x 135 x 106)	7.83 x 6.22 x 3.78 (199 x 158 x 96)
Description	Page 29	Page 29
Technical Information	TI00145R	TI00146R

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 its 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 setup is possible via the configuration software FieldCare, for example, or DIP switches.
The devices include a high contrast, backlit display of the respective value.
The integrated bargraph with over- and under range indication in the RID14 and RID16 offers a quick value overview. Both devices also offer an integrated 14-segment field for plain text or TAG.
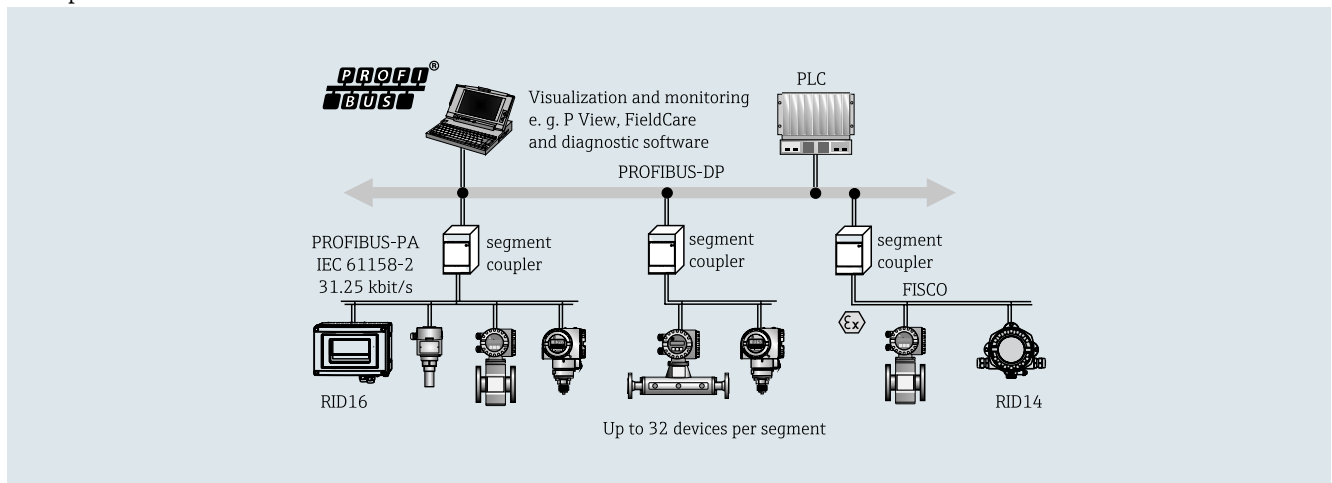
You gain through

- 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
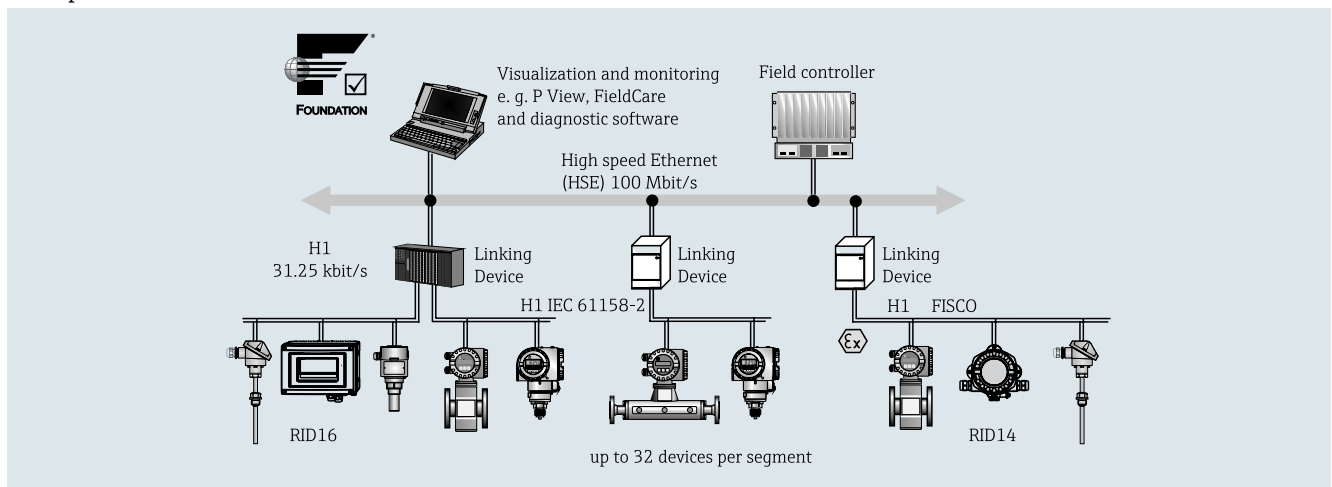
Example of a PROFIBUS PA Connection

Interface devices at a glance

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 98 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, SIL, UL, NEPSI, GL, WHG	-
SIL	2	-
Display	LCD, 5-digit, bargraph, messages and user-defined text	LCD, 4-digit
Interfaces	PC interface, HART ports	-
Width in inches (mm)	1.77 (45)	1.77 (45)
Description	Page 33	-
Technical information	TI00150R	TI00074R

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	-	2
-	-	-
0/1	-	-
HART® status monitoring	-	-
ATEX, FM, CSA, TIIS, IECEx, GL	ATEX, FM, CSA	UL, GL
2	3	-
-	-	-
HART ports	HART ports	HART ports
0.89 (22.5)	0.89 (22.5)	0.89 (22.5)
Page 33	Page 33	-
TI00073R	TI00132R	TI00081R

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-in 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 (hazardous) area approvals
- HART communication ports
- Plug-in screw terminals

Application examples

Interface devices

Deltapilot S

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.

RMA42

Pressure display: RIA16

Deltapilot S   Level display: RIA16
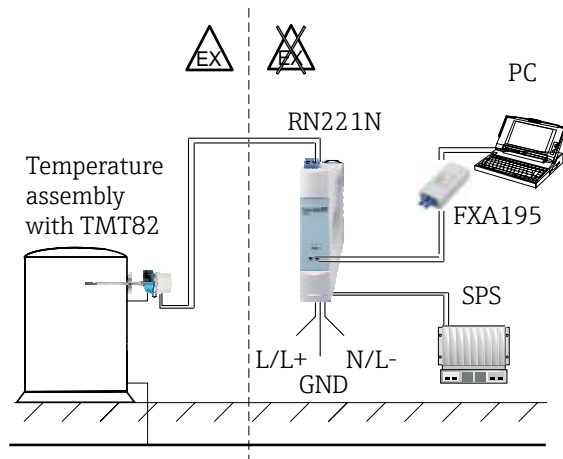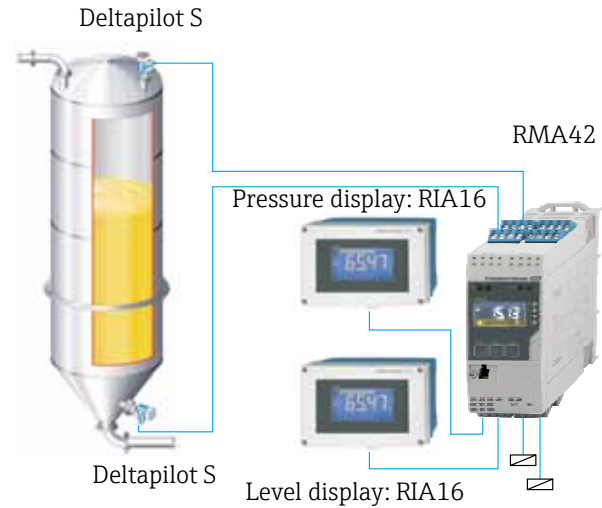
RN221N Supply of a temperature measurement point
If a 4 to 20 mA HART head transmitter TMT82 is installed in a temperature assembly it has to be supplied with power.
The active barrier RN221N supplies the head transmitter with power, if required also in the Ex (hazardous) area, and then transmits the 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 briefly occurring errors can be easily located.

PC

RN221N

Temperature assembly with TMT82

FXA195

SPS

L/L+   N/L-
GND

SPS   RMA42

or

RB223 Passive barrier with SPS
If a sensor in the Ex (hazardous)-area is to be supplied via a SPS the use of a barrier is necessary. The RB223 transmits the supply from the Non-Ex (non-hazardous) area into the Ex (hazardous)-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.

RB223

230 V AC

Active 4 to 20 mA current output

Active 4-wire sensor with external supply
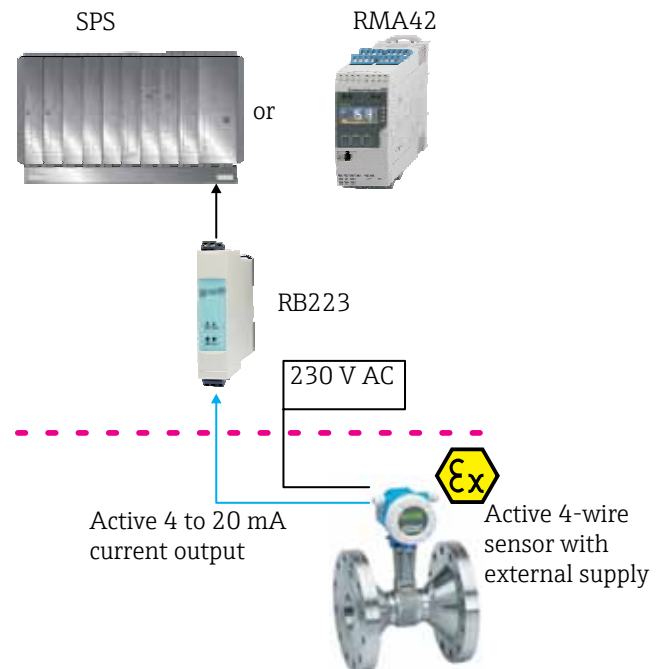
Surge arresters at a glance

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 %)	0/4-20 mA, PFM, PA, FF	0/4-20 mA, PFM, PA, FF	RS485, Modbus , PROFIBUS DP	Protection module Prosonic S
SPD class	Type3 P3		Type1 P1			
Certificates	SIL 2					
Approvals	-	-	-	ATEX/IECEx II2 (1)G Ex ia [ia Ga] IIC T6 Gb	-	-
Accessories	Field housing, mounting kit		Field housing, mounting kit, screen grounding clamp			Field housing, mounting kit
Dimensions WxH in inches (mm)	0.71 x 3.54 (18 x 90)	0.71 x 3.54 (18 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 (12 x 90)
Technical information	TI01012K					

HAW569 – for field mounting

Version / order code	HAW569-AA2B	HAW569-DA2B	HAW569-CB2C
Construction			
Application	Surge protection of signal cables (0/4-20 mA, PFM, FF, PA)		Surge protection of signal cables (0/4-20 mA, PFM, 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\n\nParallel connection – no additional resistor in the circuit
Approvals	Non Ex (non-hazardous) area	ATEX/IECEx II2 (1) G Ex ia [ia Ga] IIC T4/T5/T6 Gb	ATEX/IECEx II 2 G Ex d IIC T5/T6 Gb
Certificates	SIL 2		
Accessories	M20 / NPT ½ in. adapter Cable gland set Grounding washer	M20 / NPT ½ in. adapter Cable gland set Grounding washer	M20 / NPT ½ in. adapter
Dimensions	AF 1.06 x 2.8 in (SW 27 x 71 mm)	AF 1.06 x 2.8 in (SW 27 x 71 mm)	AF 1.06 x 2.48 in (SW 27 x 63 mm)
Technical information	TI01013K		

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 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, 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.
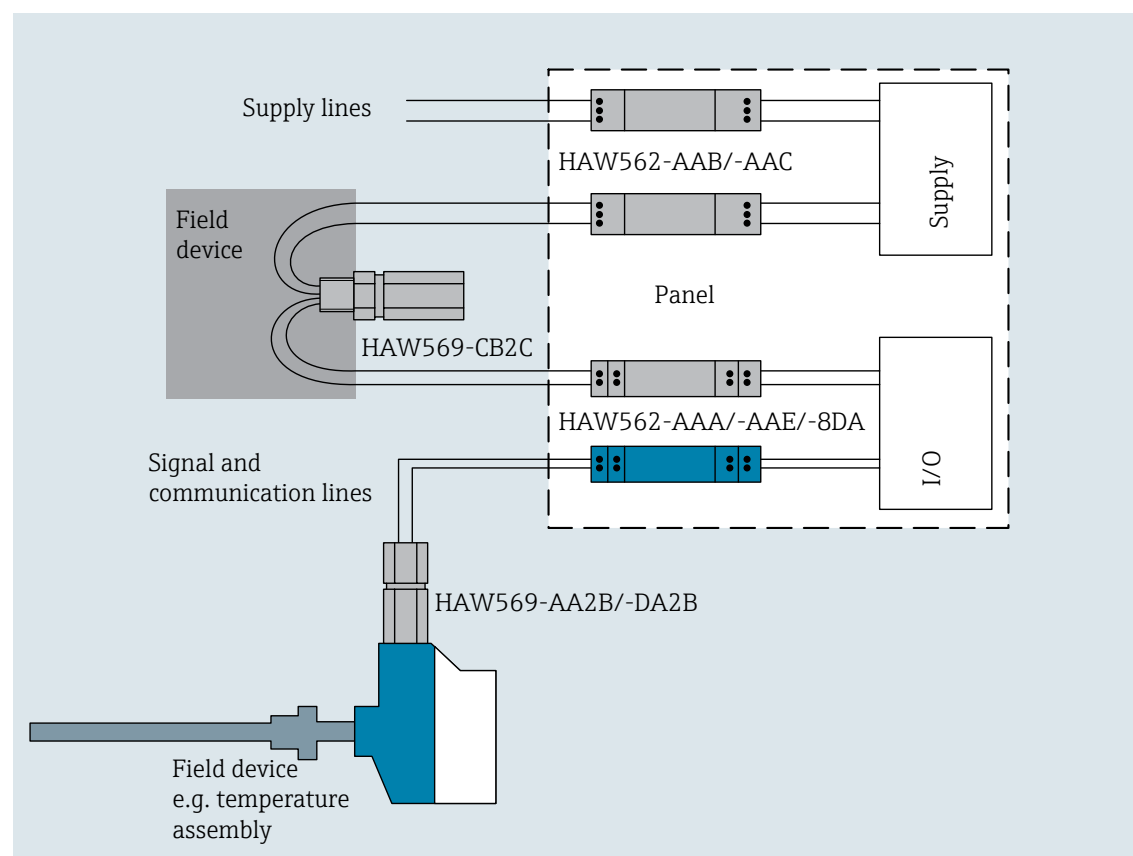
Field Data Manager software MS20

Data management made easy
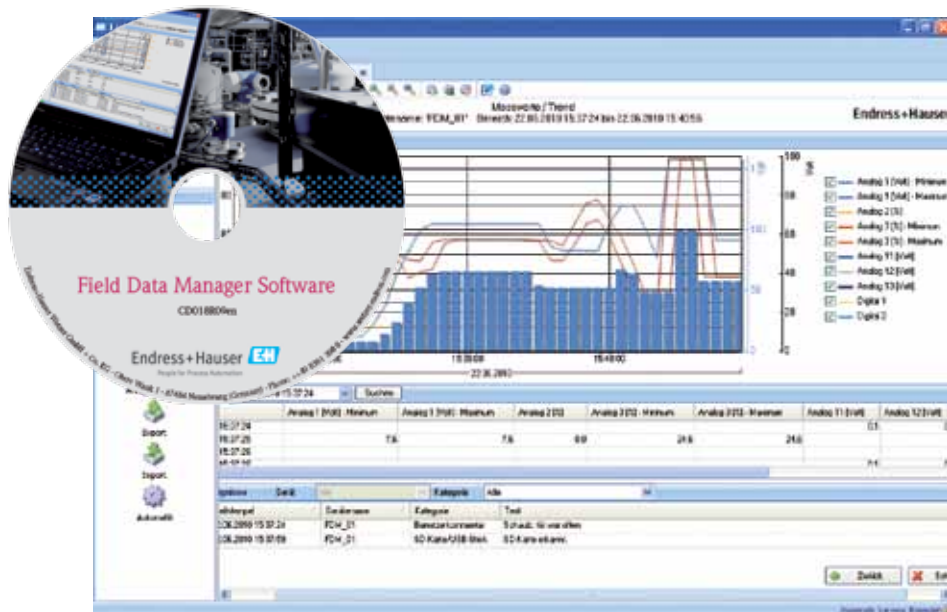
The FDM software offers various possibilities to display, manage and archive data from the production process. Data is stored in a data base, thus extensive searching and complicated data handling is avoided.
With the help of the manipulation proof data management the requirements of the legislator and 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, i.e.

- Measurements (analog and digital signals, calculated values)
- Event diagnostics
- Protocols

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-safe 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 future systems. ERP systems (such as SAP) can directly access the stored measurements and reprocess these.

Automatic transmission/export & import

An automatic readout is done using the PC integrated system service. This permits the readout of devices and the storage of the data in the respective data bases parallel to other activities such as generating reports or export/import activities. Using the import function plan values can be loaded into the database in a xls or csv format. So plan/actual comparisons can be carried out in the area of energy monitoring.
Furthermore, automatic reports can be generated in PDF format which is an advantage particularly for the pharmaceutical industry.

→ Order number for detailed technical information:
TI01022R

FDA 21 CFR 11

Safety is ensured by the software audit trail which conforms to the FDA requirements as well as by the extensive user management functions. Using different user models restricted access can be assigned. Only the information that is relevant for his appropriate task area is offered to the employee.
FDM fulfills the high safety requirements of the FDA 21 CFR 11 through:

- Encoded data with manipulation recognition and marking
- Efficient password and access authorization system
- Storage of all modifications 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 and RS33
- Batch controller RA33
- Ecograph, Ecograph A/C/T
- Memograph, Memograph M/S
- Liquiline® CM44x
- Sampler with Liquiline CM44x

Test version

You can test the FDM software without obligation. We offer a trial version which can be used free of charge for 90 days.

You can find the current software:
www.us.endress.com/ms20

ReadWin® 2000

Device parameterization and online visualization

ReadWin 2000 is a common PC software for all
Endress+Hauser recorders for setting up, commissioning,
communicating and analyzing.
ReadWin 2000 is an integral part of the delivery of all
units. Users can install and use the software without any
restrictions.

The newest ReadWin 2000 version can be found on
the Internet at: www.us.endress.com/ReadWin

ReadWin 2000 provides the following functions:
- Device settings can be displayed, changed and stored as a
  setup file. These settings can be both read out as well as
  transmitted to the device using interfaces (RS232 /
  RS485, Ethernet, modem) or by means of ATA flash or
  CF card.
- Transmission of data from recorders and storing of data
  in data bases
- Display of data by print out
- Export of data in Excel format

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.

Order number for detailed
technical information:
TI00122R

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.

You can find the current software version of the OPC:
www.us.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

Energy software eSight

Evaluate energy data
Highlight potential savings

Visualization and evaluation of process data, however, are the real keys to benefit fully from measurement technology. The web-based energy monitoring software we use permits access to the entire management system in your plant from anywhere via an intranet or the Internet. In addition, this software can be used to analyze measurement data and to create energy reports. This software solution is used in many different industries.

- World-wide or local usage via intranet or Internet
- Simple operation
- Easy-to-use interface with drop-down menus
- Automatic data import from data loggers, SCADA systems, production systems or building management systems
- Simple integration into any existing operating data recording system
- Modular software design, customization possible at all times

Energy analysis
- Monitor energy consumption (electricity, water, fuel)
- Assess the efficiency of compressors, steam boilers, refrigeration systems or pumps (regression analysis)
- Target/actual comparison of energy data
- Identify peak values during energy consumption

Cost analysis
- Create diagrams and displays:
  - Costs for energy consumption
  - Costs for generating steam, compressed air, etc.
  - Time-based comparisons
- Create and monitor budget plans (target/actual)
- Cost comparisons with different price changes for energy sources
- Profitability calculations (ROI, Return on Investment)

Reporting
- Produce cumulative curves or comparative displays with predefined tables and graphical formats
- Automatic sending of energy reports (PDF files) via e-mail or via storage on a central server

Deviation analysis
- Trigger warning messages via e-mail or SMS
- Set limit values
- Prioritize warning messages in accordance with process criticality

Simulation/calculation
- Calculate characteristic values using mathematical functions.
 Example: Emission = mass × heat value × emissions factor × oxidation factor

Billing verification*
- Automatic import of supplier invoices
- Comparative functions (validation) between the requested amount and the amount calculated based on measurement data

* Not available in all regions / or country specific

→ Order number for detailed technical information:
TI01074R
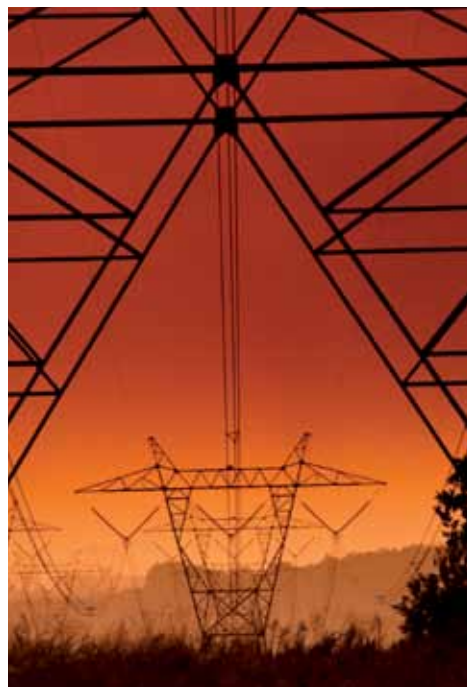
Monitor the specific energy consumption
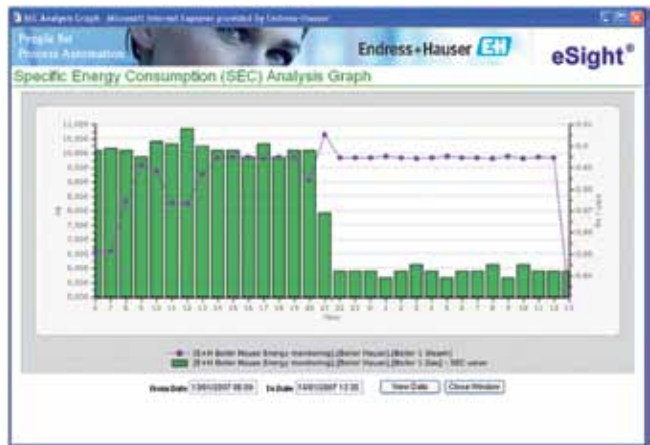
Benchmark and budget analysis indicate deviations from default values

Consumption profile of a measuring point across various days of the week

Simple reporting provides transparency

Additional technical documentation

We would be pleased to send you additional detailed Technical Information
Order numbers can be found in the last line of the product tables.

Or as a download from:
www.us.endress.com/download

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ISO 9001 Certified

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People for Process Automation