

metronic

Data loggers
Flow computers
Converters
Softwares

7th edition

Product Catalog



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WE DEVELOP MANUFACTURE AND MODERNISE

For over 25 years, Metronic AKP has specialised in developing and manufacturing electronic devices for measurement and data logging of industrial processes. Our range of products are specialised for measuring of compensated flow and energy of steam and condensate, the measure of compensated flow of process gases, monitoring and recording temperature or other physical quantities.

Metronic AKP measuring instruments and recorders are currently used in small and large industrial plants. Our products are present in power plants, refineries, food plants, steel plants, water and gas plants. We are constantly striving to improve and offer modern and robust devices and service. Creating our devices, we pay special attention to reliability, not forgetting to maintain proper aesthetics of products. We try to make our devices easy and intuitive.

At the request of the customers, we are also able to deliver accessories for the control and measurement equipment of our own production. We are always ready to advise and help with metrological problems. Company participates in the development and customization of measuring equipment to meet individual needs and solves many unusual problems.

Metronic AKP is based on experienced team of engineers and technicians. All activities of the company are undertaken in accordance with the quality management system ISO 9001-2015, which has been confirmed by the relevant certificates since year 2009. We constantly improve the quality of our products and services. We respect and get the most out of the opinions from our customers.

OUR CUSTOMERS BENEFIT FROM

- High quality measuring devices tested in various tough conditions
- Our technical personnel's experience
- Fast orders fulfilment
- Training in the use and maintenance of our devices
- Technical advice on device selection
- Attractive business conditions

The entire range of our products can be found at: www.metronic.pl

For more information, please contact our office directly.

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Multichannel Electronic Data Loggers

Depending on model and version, electronic recorders have from 3 up to 42 measurement channels. They are developed for direct connecting of RTD and TC temperature sensors, or voltage and resistance transducers, 0/4-20mA current loop transducers and 0.001 Hz to 10 kHz pulse output transducers. Some devices are able to read data from transducers or other devices using standard digital protocols Modbus RTU (RS-485) or Modbus TCP (Ethernet) and HART (4-20mA).

The devices are available in panel mount or wall mount housings, as well as standalone.

The measurement results may be shared locally or transmitted to a supervising computer or control system using the RS-485 communication port. Most of the models have a built in Ethernet port for operation in industrial LAN networks.

Various additional functions extend measurements to simple control and alarming, mathematical operations on measured results, tracking extreme and average values.

The colour displays with touch panel offer easy to operate user interface for various result presentation options – trends, bar graphs, bar charts, summary result tables, etc.

The ability to combine different types of measurement input / output modules in one device allows our products to be customised, making them ideal for many typical and specialised applications.

APPLICATIONS

- Multi-point measurements of physical quantities (e.g. temperature, humidity, pressure) with local readout and data transmission to a supervising computer or control system
- Measurements and data recording with simple control and alarming functions
- Distributed measurement and control systems with local readout and local data recording (local data back-up)

DATA LOGGERS – GENERAL FEATURES COMPARISON

	DL2	DL7
Number of inputs / outputs	3 to 12 (depends on number of installed I/O modules)	3 to 42 (depends on number of installed I/O modules)
Number of displayed channels	up to 30	up to 100
Available input types	RTD, TC, 0/4-20mA, 0-10V, RS-485 (master), PULS, HART, inputs for strain gauges, Modbus TCP (client)	RTD, TC, 0/4-20mA, 0-10V, RS-485 (master), PULS, HART, inputs for strain gauges, Modbus TCP (client)
Base content	ethernet port, RS-485 port, 1 analog output 4-20mA, 4 relay outputs	ethernet port, RS-485 port
Number of available slots for I/O modules	2	7
Display	colour graphic LCD 4" + Touchscreen	colour graphic LCD 7" + Touchscreen
Communication ports, transmission protocol	RS-485 (M.RTU), Ethernet (M.TCP, WWW server)	RS-485 (M.RTU), Ethernet (M.TCP, WWW server)
Housing version	panel mount, wall mount	panel mount, standalone, wall mount, portable version

DL7, DL7L

Multichannel electronic data logger



- 3 to 42 measuring inputs
- Up to 100 displayed channels
- 7" Touchscreen colour LCD
- Internal 2 GB memory, advanced data recording
- USB port on the front panel, IP54 protected
- Ethernet port, Modbus TCP Client/Server, RS-485 port, Modbus RTU Master/Slave
- Dedicated PC software for commissioning and archive data visualisation
- Available languages: EN, DE, ES, FR, PL, PT

DL7 is a modular data recorder, developed for wide range of multichannel process measurements and data logging. Its modular construction and offered twelve different types of I/O modules, allows to configure customised measurement system. Simple configuration does not requires extra programming skills. Device may be quickly configured by the user from front panel or using commissioning software on PC.

BASE MODULE M

- USB port (rear panel second port)
- Ethernet port (Modbus TCP, WWW server)
- RS-485 port (Modbus RTU)
- 24 VDC device power supply input

INPUT / OUTPUT MODULES

- IN6I(24V) – six channel 0/4–20mA input type module for passive or active transducers (internal 24 VDC output for loop power supply)
- IN6I – six channel 0/4–20mA input type module for active transducers
- IN6T - six analog inputs for connection temperature RTD sensors type Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000, Cu50, Cu53, Cu100, KTY81, KTY83, KTY84 and connection thermocouples TC type J, L, K, U, E, N, B, R and S; and linear measurement of resistance 0 .. 4500 Ω or voltage -140 .. +140 mV
- IN6V - six analog inputs for connecting as standard -10 .. + 10 V, 0..10 V, 2 .. 10 V, 0 .. 5 V, 1 .. 5 V
- IN6 - six analog inputs, inputs 1-3 enable connection of RTD temperature sensors, TC thermocouples and linear measurement of resistance 0 .. 4500 Ω or -140 .. +140 mV, inputs 4-6 enable the connection of transducers in the 0 / 4-20mA standard, 0 / 2-10V, 0 / 1-5V
- IN4SG - four analog inputs +/-30 mV for direct connection of strain gauges with a sensitivity of 1, 2, 4 mV / V or other, four discrete inputs for resetting (tare) analog inputs, power supply for strain gauges 5 VDC
- IN6D - six PULS inputs; ability to work in a state mode, frequency measurement mode (0.1 .. 1000 Hz), pulse counting (0 .. 100 Hz)

- ⊙ IN2RS485(24V) - two independent and galvanically separated RS-485 ports for reading transducers or other devices operating in the Modbus RTU standard; extra 24VDC voltage source power supply for external transducers
- ⊙ IN2RS485 - two independent and galvanically separated RS-485 ports for reading transducers or other devices operating in the Modbus RTU standard
- ⊙ 1HRT - one HART (4-20 mA) port with the possibility of powering transmitters, operating in the Primary Master mode or in the Secondary Master mode
- ⊙ OUT6RL - six solid state relays output rated at 24 VAC / 0.5 A or 36 VDC / 0.5 A
- ⊙ OUT3 - three programmable analogue outputs 0/4-20mA, 0/1-5V, 0/2-10V
- ⊙ PSBATT - supplying the device with NiMH storage batteries in the event of voltage break (backup) or periodic operation with battery power supply (from 1 to 20 hours depending on the configuration)

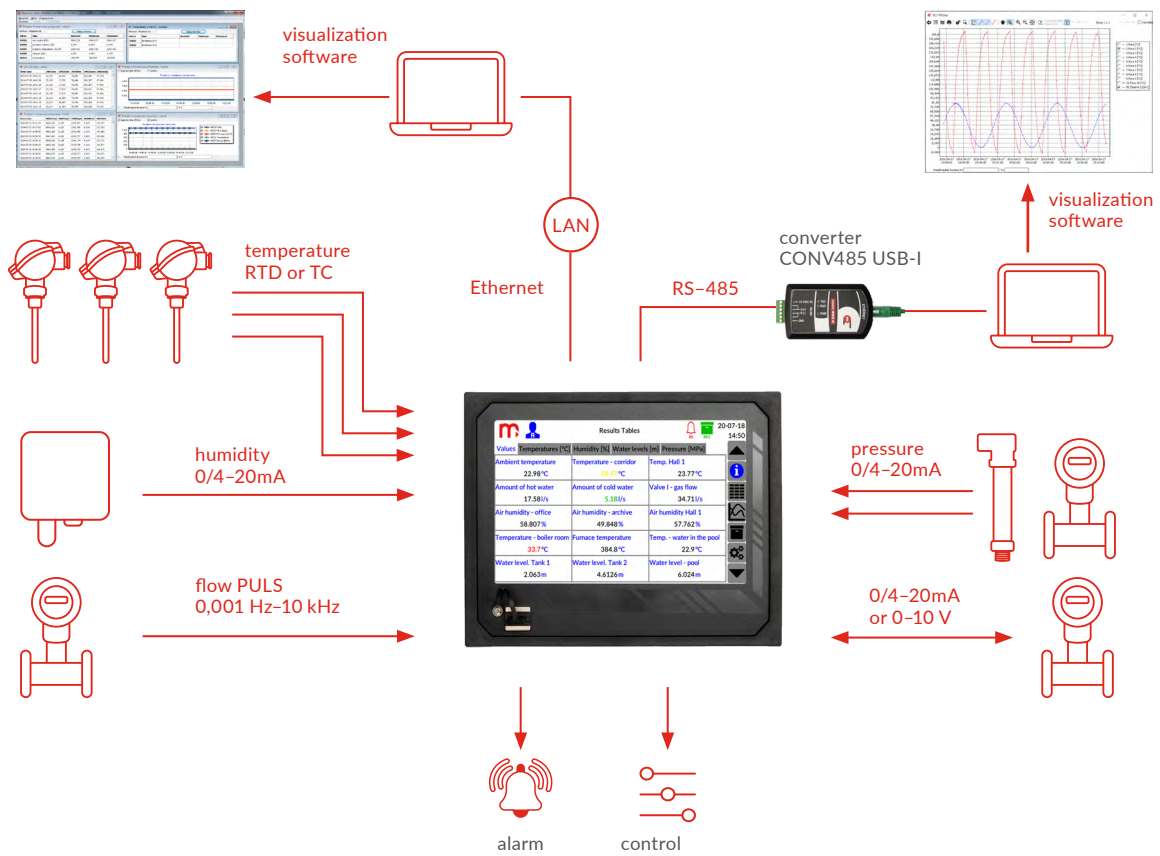
RECORDING MEASUREMENT RESULTS

- ⊙ Internal 2 GB flash memory for process data and totalizers recording
- ⊙ Recording rate for main archive from 2 s to 24 h; two recording rates toggled by alarms state
- ⊙ Recording rate for totalizers archive from 1 min to 24 h
- ⊙ Checksum secured files – protection against data manipulations

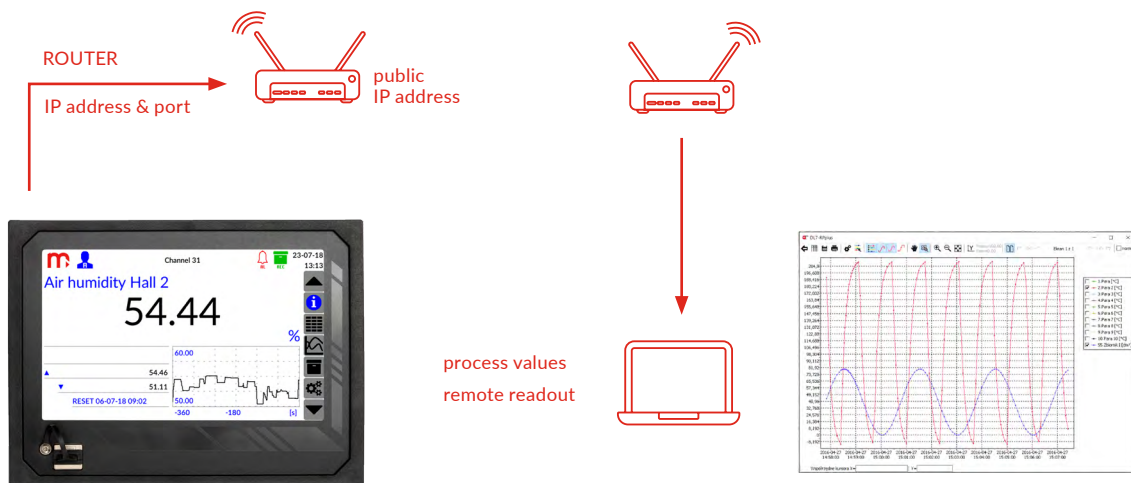
OTHER FUNCTIONS

- ⊙ Alarm / Control – two alarm or control thresholds for each of the one hundred channels
- ⊙ Totalizers – two totalizers for each of the one hundred channels
- ⊙ Tracking minimum and maximum value of each channel
- ⊙ Mathematical functions (math channels)
- ⊙ Dumping filter with a selected time constant that allows the measurement of noisy or fluctuating signals
- ⊙ Grouped data presentation in up to 6 tables with 15 results each
- ⊙ Grouped trends presentation in up to 6 graphs with 6 trends each
- ⊙ E-mails regarding alarm states and cyclical reports with totalizers values (up to 5 recipients)
- ⊙ Print Screen option to a bmp file
- ⊙ Event Log
- ⊙ Standalone housing version available (DL7L)

EXAMPLE APPLICATION



READ THE RESULTS OF MEASUREMENTS THROUGH THE INTERNET NETWORK



DL7W KIT

Wall enclosure for DL7 data logger



- Transparent door closed with a latch
- The possibility of closing the padlock or placing a seal
- High degree of protection against water and hazardous parts (IP65)
- TS-35 rail enabling the montage of additional elements
- Switching power supply 230 VAC / 24 VDC (25 W or 50 W)
- 6 cable glands for connecting I/O signals
- 1 cable gland for connecting an Ethernet cable with an RJ-45 connector
- Openable mounting plate - easy electrical installation

The DL7W KIT enables the installation of the DL7 data logger indoor or outdoor.

DL7C Case KIT

DL7 data logger in the shockproof case



- Portable DL7 data logger
- Up to 6 I/O modules can be installed
- Supplying of sensors or transducers
- Up to 18 M12 connectors for connecting I/O signals
- M12 connector to connect the external power supply unit
- M12 connector for Ethernet port (option)
- M12 connector for RS-485 port (option)
- Tight closing of the housing lid, high protection class (IP67 for a closed case)
- The possibility of closing the housing with a padlock

DL7 Case KIT enables operating the DL7 data logger using storage batteries (from 1 to 20 hours, depending on the number and types of installed I/O modules) or operating the DL7 device using delivered external power supply unit and standby supplying in the event of voltage break (backup). The device enables supplying sensors or transducers connected to the recorder with using an external battery.

DL2

Electronic data logger



- 3 to 12 measuring inputs
- Up to 30 displayed channels
- 4" Touchscreen colour LCD
- Internal 2 GB memory, advanced data recording
- USB port on the front panel, IP54 protected
- Ethernet port, Modbus TCP Client/Server, RS-485 port, Modbus RTU Master/Slave
- Dedicated PC software for commissioning and archive data visualisation
- Available languages: EN, DE, ES, FR, PL, PT

DL2 is a modular data recorder, developed for wide range of applications and process measurements. Its modular construction and available twelve of different types I/O modules, allows to configure customised measurement system. Simple configuration does not requires extra programming skills. Device may be quickly configured by the user from front panel or using commissioning software on PC.

BASE MODULE M

- Ethernet port (Modbus TCP, WWW server)
- RS-485 port (Modbus RTU)
- 4 alarm / control relays (SSR type)
- 24 VDC device power supply input

INPUT / OUTPUT MODULES

- IN6I(24V) – six channel 0/4–20mA input type module for passive or active transducers (internal 24 VDC output for loop power supply)
- IN6I – six channel 0/4–20mA input type module for active transducers
- IN6T - six analog inputs for connection temperature RTD sensors type Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000, Cu50, Cu53, Cu100, KTY81, KTY83, KTY84 and connection thermocouples TC type J, L, K, U, E, N, B, R and S; and linear measurement of resistance 0 .. 4500 Ω or voltage -140 .. +140 mV
- IN6V - six analog inputs for connecting as standard -10 .. + 10 V, 0..10 V, 2 .. 10 V, 0 .. 5 V, 1 .. 5 V
- IN6 - six analog inputs, inputs 1-3 enable connection of RTD temperature sensors, TC thermocouples and linear measurement of resistance 0 .. 4500 Ω or -140 .. +140 mV, inputs 4-6 enable the connection of transducers in the 0 / 4-20mA standard, 0 / 2-10V, 0 / 1-5V
- IN4SG - four analog inputs +/-30 mV for direct connection of strain gauges with a sensitivity of 1, 2, 4 mV / V or other, four discrete inputs for resetting (tare) analog inputs, power supply for strain gauges 5 VDC
- IN6D - six PULS inputs; ability to work in a state mode, frequency measurement mode (0.1 .. 1000 Hz), pulse counting (0 .. 100 Hz)
- IN2RS485(24V) - two independent and galvanically separated RS-485 ports for reading transducers or other devices operating in the Modbus RTU standard; extra 24VDC voltage source power supply for external transducers

RECORDING MEASUREMENT RESULTS

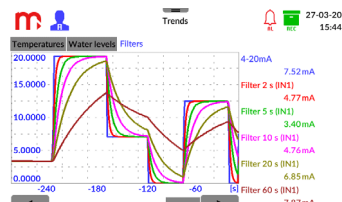
OTHER FUNCTIONS

- IN2RS485 - two independent and galvanically separated RS-485 ports for reading transducers or other devices operating in the Modbus RTU standard
- 1HRT - one HART (4-20 mA) port with the possibility of powering transmitters, operating in the Primary Master mode or in the Secondary Master mode
- OUT6RL - six solid state relays output rated at 24 VAC / 0.5 A or 36 VDC / 0.5 A
- OUT3 - three programmable analogue outputs 0/4-20mA, 0/1-5V, 0/2-10V
- PSBATT - supplying the device with NiMH storage batteries in the event of voltage break (backup) or periodic operation with battery power supply (from 1 to 20 hours depending on the configuration)
- Internal 2 GB flash memory for process data and totalizers recording
- Recording rate for main archive from 2 s to 24 h; two recording rates toggled by alarms state
- Recording rate for totalizers archive from 1 min to 24 h
- Checksum secured files – protection against data manipulations
- Alarm / Control – two alarm or control thresholds for each of the one hundred channels
- Totalizers – two totalizers for each of the one hundred channels
- Tracking minimum and maximum value of each channel
- Mathematical functions (math channels)
- Grouped data presentation in up to 6 tables with 15 results each
- Grouped trends presentation in up to 6 graphs with 6 trends each
- E-mails regarding alarm states and cyclical reports with totalizers values (up to 5 recipients)
- Print Screen option to a bmp file
- Event Log

EXAMPLE DATA PRESENTATION

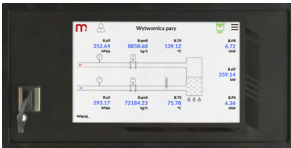


Values	Water level	Filters	Table 5	Table 6	
Ambient temperature	21.12 °C	Temperature (warehouse)	12.13 °C	Water level tank 4	28.9049m
Amount of water injected	6.25 kg/s	Water level tank 1	24.3467m	4-20mA	17.87 mA
Steam pressure	13.23 MPa	Water level tank 2	26.4182m	Filter 2s (IN1)	15.33 mA
Air humidity hall 1	43.90 %	Water level tank 3	16.3964m	Filter 5s (IN1)	11.13 mA
Air humidity storage	14.73 %	Σ of water tanks 1-3	67.1613m	Filter 60s (IN1)	1.64 mA



Flow computers for calculating compensated flow and thermal energy of steam, water and other liquid media and compensated flow of process gases with data recording

The FP-30x1(N), FP40 and FP70 are modern, universal computers for measuring and calculating the consumption and energy of steam and water in heating / cooling systems and steam boiler houses, measuring the compensated flow of process gases and other liquid media (glycol, chilled water). The flow computers can work in distributed control systems in RS485 or Ethernet network with local data recording of process values and local readouts.



- The flow and heat of a liquid
- The flow and delta heat of a liquid in a closed supply-return installation
- The flow and delta heat of a liquid in an installation with different supply and return flowrates
- The flow and heat of steam
- The flow and delta heat in a closed steam-condensate installation
- The flow and delta heat in steam-condensate installation with different steam and condensate flowrates
- The flow and delta heat in steam generating installation with the supplied water flowrate measured
- The flow of technical gas
- Flow computers can interact with the following types of flowmeters:
 - Mass flowmeters
 - Volumetric flowmeters
 - Differential pressure flowmeters with approximation using root characteristic or according to an iterative algorithm, compliant with PN-EN ISO 5167 (only for water and steam)

COMPENSATION RANGE OF STEAM AND WATER PARAMETERS

Flow computer enables flow and energy measurement of unsaturated or saturated vapour and water according to IAPWS-IF97 guidelines, within a working temperature range of 0°C to 800°C and an absolute pressure range of 0.05 MPa to 16.52 MPa. In the case of systems for measuring the flow and energy of other liquids, calculations are made within a range of tabular values entered by the user; both the density and specific enthalpy are functions of temperature.

FLOW COMPUTERS – GENERAL FEATURES COMPARISON

	FP-3011	FP-3021	FP-3031
Inputs	2x RTD / 4-20mA 1x 4-20mA 2x PULSE / 4-20mA	1x RS-485 (Modbus RTU) 1x HART 2x PULSE	3x RTD / 4-20mA 4x 4-20mA 3x PULSE / 4-20mA
Number of measuring installations	2 (A, B)	2 (A, B)	3 (A, B, C)
Number of auxiliary installations	none	none	3 (X, Y, Z)
Analogue outputs (optional)	1	1	1 or 2
Display	3,5" TFT	3,5" TFT	3,5" TFT
Panel mount version dimensions	144 x 72 x 130	144 x 72 x 130	192 x 96 x 63,5
	FP40	FP70	
Inputs	HART Modbus RTU RTD/4-20mA/PULS	2x RTD 6x 4-20mA 2x PULSE	
Number of measuring installations	2 (A, B)	2 (A, B)	
Math channels	Yes, functions +, -, /, *, $\sqrt{\quad}$, ^	Yes, functions +, -, /, *, $\sqrt{\quad}$, ^	
Analogue outputs (optional)	Minimum 1	1 or 2	
Display	Colour graphic LCD 4" + Touchscreen	Colour graphic LCD 7" or 5" + Touchscreen	
Panel mount version dimensions	144 x 72 x 130	192 x 96 x 63,5	

FP70-P, FP70-W

Flow computer for calculating compensated flow and thermal energy of steam, water and other liquid media



- ◉ Up to 2 independent installations (A, B)
- ◉ Flows and energy balance calculations (systems X)
- ◉ 10 measurement inputs
- ◉ Math channels & functions (+, -, /, *, $\sqrt{\quad}$)
- ◉ Alarm & control functions, 4 solid state relays (SSR)
- ◉ 4-20mA analogue output - one or two (option)
- ◉ Advanced data logging, recording data to the text files, 2 GB internal data memory
- ◉ Colour graphic LCD 7" or 5" + Touchscreen
- ◉ RS-485 port (Modbus RTU), Ethernet port (Modbus TCP, WWW server)
- ◉ USB port on the front panel
- ◉ Dedicated PC software for commissioning and archive data visualization
- ◉ Available languages: EN, DE, ES, FR, IT, PL, PT

INPUTS

- ◉ The device has 10 measurement inputs:
 - 2 x RTD, two inputs adapted for connection of resistance temperature sensors (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000, Cu50, Cu53, Cu100, KTY81, KTY83, KTY84)
 - 6 x I, six inputs for 0/4-20mA transducers,
 - 2 x PULS, two inputs intended for connection of transducers with a pulse output (range 0.02 Hz ... 12,5 kHz).

AUXILIARY CHANNEL

- ◉ 24 auxiliary channels, measurement of additional quantities or calculation of the formula entered by the user (available mathematical operations: addition, subtraction, multiplication, division, extract the root)

TOTALIZERS

- ◉ Totalizers for energy and flow measurements (2 for each channel)
- ◉ Totalizers can be reset manually or automatically every day, week or month
- ◉ Over and under counters to be realized in additional channels X

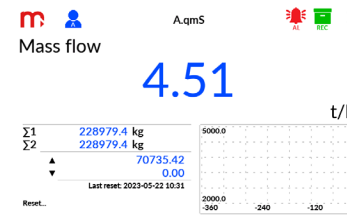
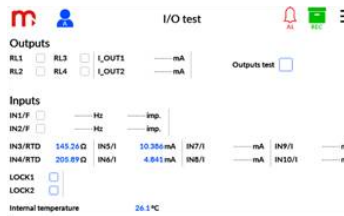
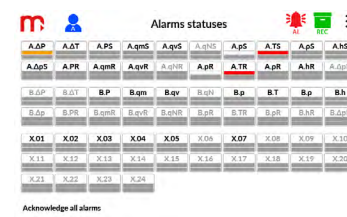
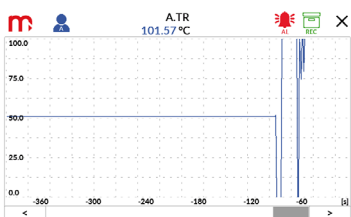
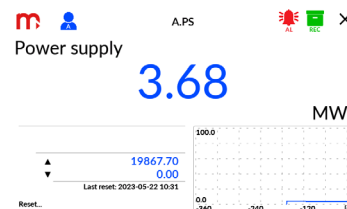
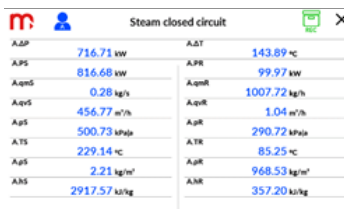
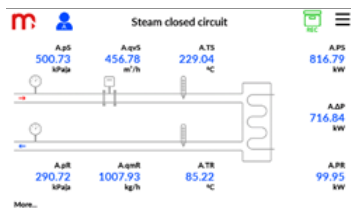
ALARMS AND CONTROL

- 2 alarm thresholds for each result
- Alarm or control mode, signaling failure of sensors connected to analogue inputs
- 4 solid state relays rated at 0.1 A/60 V
- E-mail messages about alarm states and cyclical reports with counter values (max. 5 recipients)

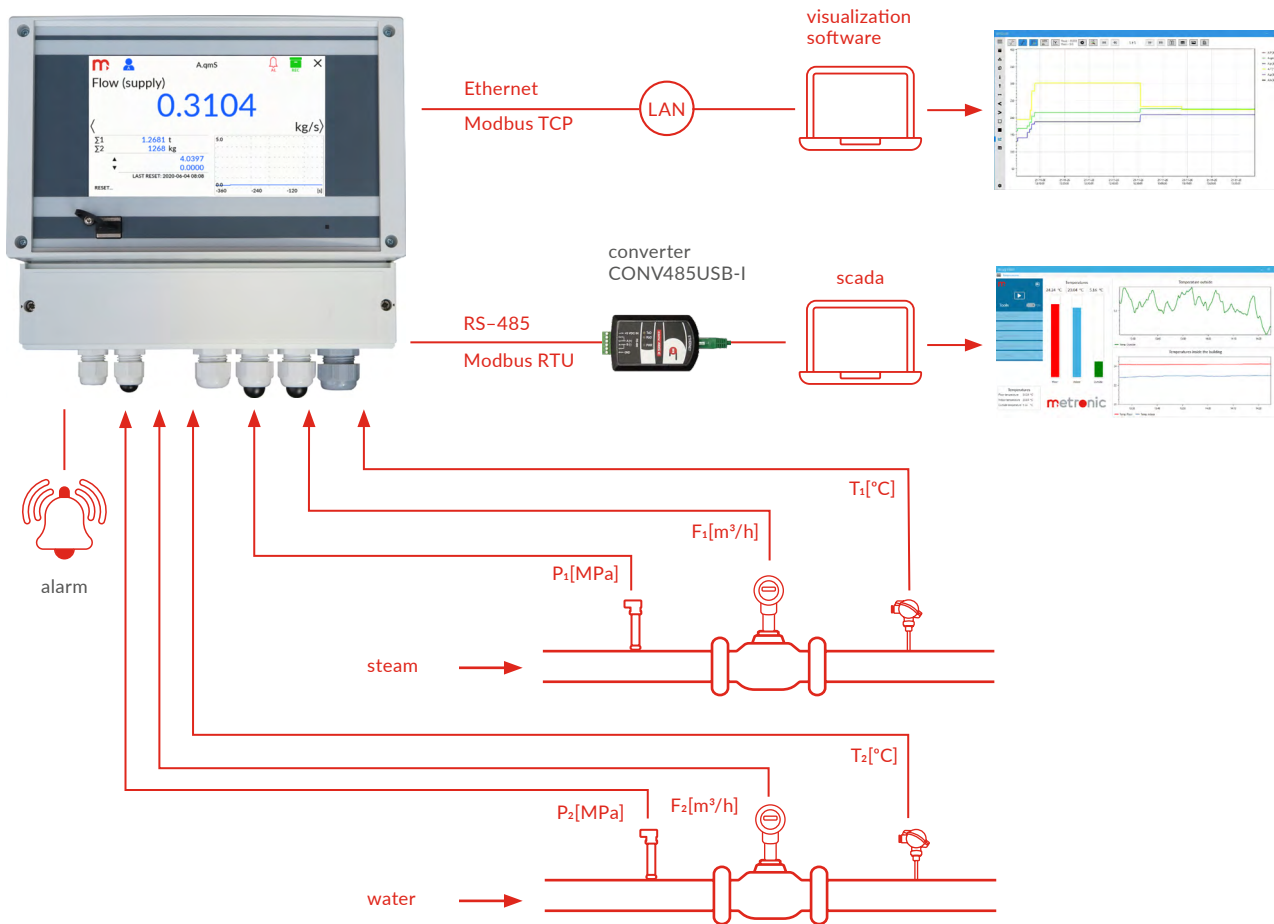
RECORDING MEASUREMENT RESULTS

- Archive files: process values (recording rate from 3 s up to 24 h)
- Event files: authorization log file, event log file, settings log file (recording after the occurrence of the event)
- 2 recording rates, toggled by alarm state for shorting/opening time of selected binary inputs
- Access to recorded data through USB port on the front panel or through Ethernet port
- Checksum secured files – protection against data manipulation

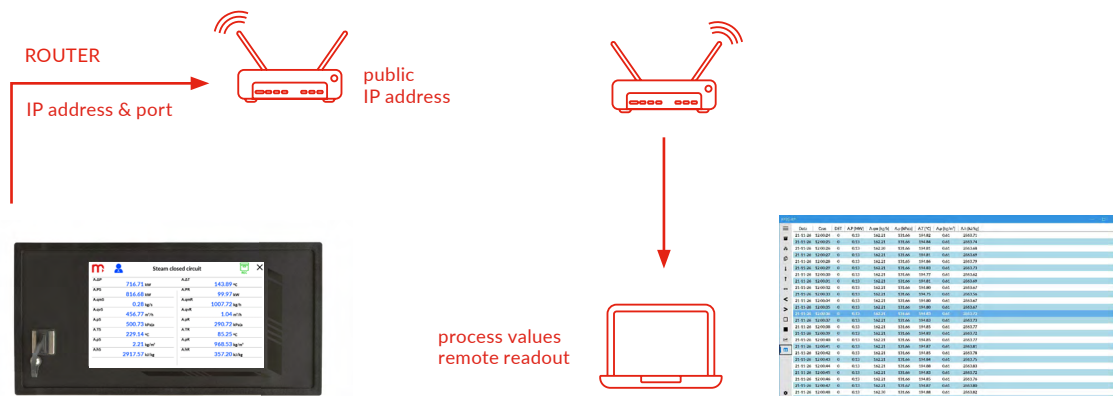
SCREEN EXAMPLES



EXAMPLE APPLICATION

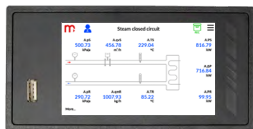


READ THE RESULTS OF MEASUREMENTS THROUGH THE INTERNET NETWORK



FP40-P

Flow computer for calculating compensated flow and thermal energy of steam, water and other liquid media



- ⊙ Up to 2 independent installations (A, B)
- ⊙ Flows and energy balance calculations (systems X)
- ⊙ Math channels & functions (+, -, /, *, $\sqrt{\quad}$)
- ⊙ Alarm & control functions, 4 solid state relays (SSR)
- ⊙ 4-20mA analogue output (possibility of expansion with further outputs)
- ⊙ Advanced data logging, recording data to the text files, 2 GB internal data memory
- ⊙ Colour graphic LCD 4" + Touchscreen
- ⊙ RS-485 port (Modbus RTU), Ethernet port (Modbus TCP, WWW server)
- ⊙ USB port on the front panel
- ⊙ Dedicated PC software for commissioning and archive data visualization
- ⊙ Available languages: EN, DE, ES, FR, IT, PL, PT

INPUTS

- ⊙ Communication with devices equipped with the HART protocol
- ⊙ Data readout from device with Modbus RTU, Modbus TCP protocol
- ⊙ PULS, 4-20mA, RTD

AUXILIARY CHANNEL

- ⊙ Auxiliary channels, measurement of additional quantities or calculation of the formula entered by the user (available mathematical operations: addition, subtraction, multiplication, division, extract the root)

TOTALIZERS

- ⊙ Totalizers for energy and flow measurements (2 for each channel)
- ⊙ Totalizers can be reset manually or automatically every day, week or month
- ⊙ Over and under counters to be realized in additional channels X

ALARMS AND CONTROL

- ⊙ 2 alarm thresholds for each result
- ⊙ Alarm or control mode, signaling failure of sensors connected to analogue inputs
- ⊙ 4 solid state relays rated at 0.1 A/60 V
- ⊙ E-mail messages about alarm states and cyclical reports with counter values (max. 5 recipients)

RECORDING MEASUREMENT RESULTS

- Archive files: process values (recording rate from 3 s up to 24 h)
- Event files: authorization log file, event log file, settings log file (recording after the occurrence of the event)
- 2 recording rates, toggled by alarm state for shorting/opening time of selected binary inputs
- Access to recorded data through USB port on the front panel or through Ethernet port
- Checksum secured files – protection against data manipulation

FP40W KIT

Wall enclosure for FP40 flow computer



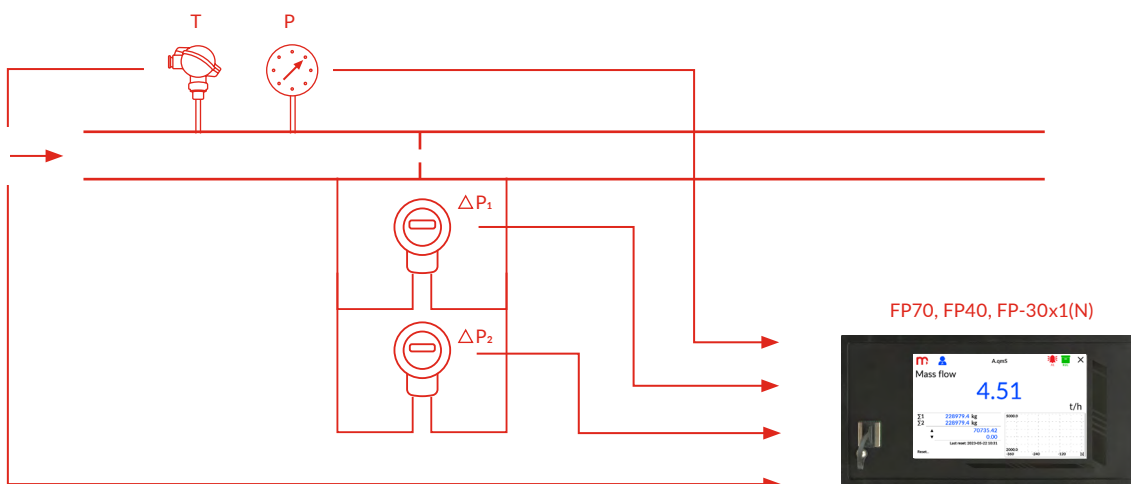
- Transparent door closed with a latch
- The possibility of closing the padlock or placing a seal
- High degree of protection against water and hazardous parts (IP65)
- TS-35 rail enabling the montage of additional elements
- Switching power supply 230 VAC / 24 VDC (25 W or 50 W)
- 6 cable glands for connecting I/O signals
- 1 cable gland for connecting an Ethernet cable with an RJ-45 connector
- Openable mounting plate - easy electrical installation

The FP40W KIT enables the installation of the FP40 flow computer indoor or outdoor.

EXAMPLE APPLICATION

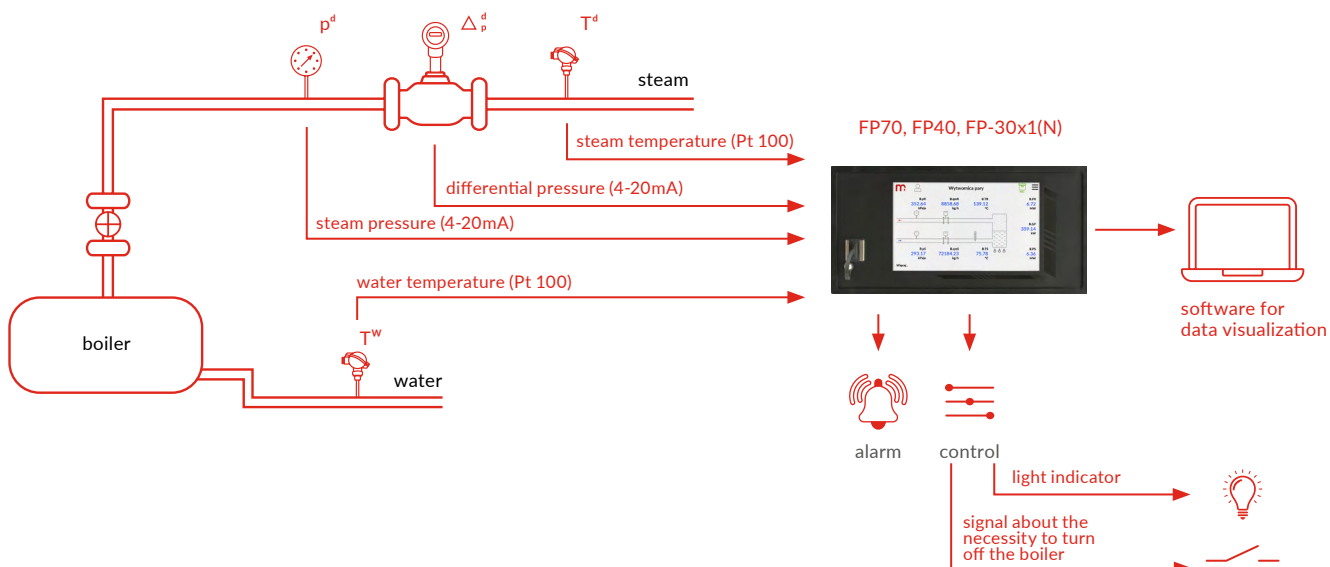
Flow computer with two differential pressure transmitters application

In the case of orifice measurements, it is often necessary to determine the value of the flow rate over a large range while maintaining a relatively high measurement accuracy. For this purpose, two differential pressure transmitters Δp and a FP70, FP40 or FP-30x1(N) flow computer are used in the system. This is an economical solution for existing or new orifice systems. It is possible to measure the flow of saturated or superheated steam, technical gases and liquids. An example of measuring system application is described below.



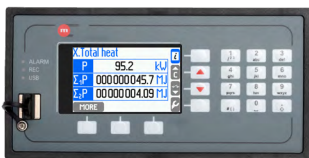
Boiler power limitation control

To fulfill the requirements of the European Parliament directive on the limitation of emissions of some pollutants into the air from medium combustion plants, it may be necessary to limit the boiler power. The use of the FP70, FP40 or FP-30x1(N) flow computer, measuring sensors and relays can switch off the boiler after exceeding the indicated value of the selected process value, in particular power. The flow computer device enables advanced recording and analysis of measurement results, which can be used to confirm the operating conditions of the system. The flow computer is an independent measuring unit that can cooperate with the supervising system. The device is equipped with relay outputs, which enables the implementation of several-stage warning before exceeding selected alarm levels or the realization of a simple control system.



FP-3031, FP-3031N

Flow computer for calculating compensated flow and thermal energy of steam, water and other liquid media



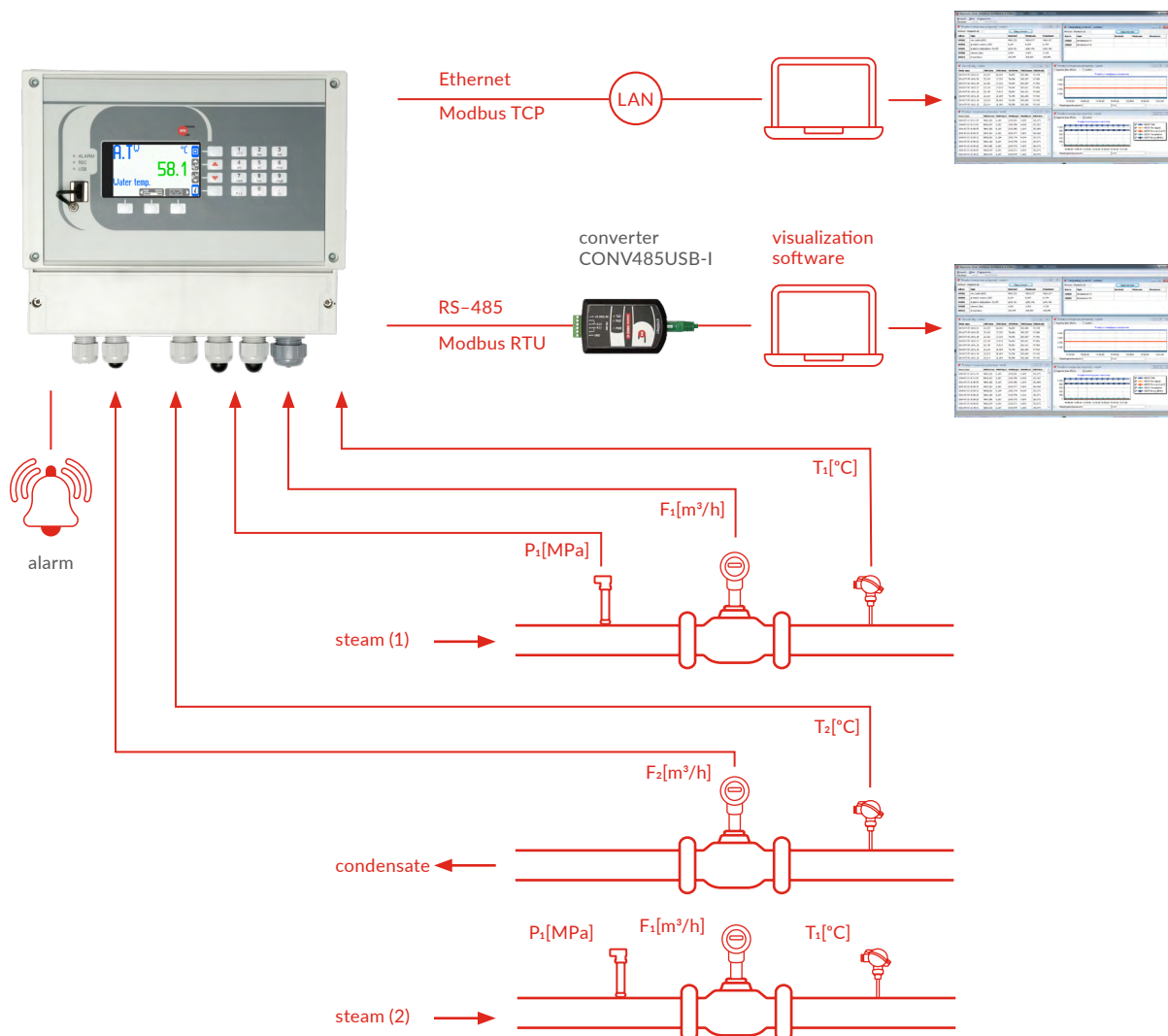
INPUTS

AUXILIARY MEASUREMENTS OR CALCULATIONS

RECORDING MEASUREMENT RESULTS

- ◉ Simultaneous flow and energy calculations in up to three different measurement applications (A, B, C) for separate process lines
- ◉ Flows and energy balancing (auxiliary X, Y, Z applications)
- ◉ 10 measurement inputs
- ◉ Alarm and control functions: 4 alarm and control thresholds for each channel
- ◉ 4 solid state relays (SSR) output relays: alarm and control functions, latched and non-latched mode, pulse output for totalizers
- ◉ 1 or 2 optional 4–20mA analogue outputs
- ◉ Internal 2 GB data memory, advanced data recording
- ◉ Colour graphic LCD TFT display
- ◉ USB port on the front panel, IP54 protected
- ◉ Ethernet Port (Modbus TCP, WWW server), RS-485 port (ASCII and Modbus RTU)
- ◉ Dedicated PC software for commissioning and archive data visualisation
- ◉ Two housing options: FP-3031 – panel mount and FP-3031N – wall mount
- ◉ Available languages: EN, DE, FR, PL
- ◉ The device has ten measurement inputs:
 - 3 x RTD/I, three inputs for direct connecting resistive temperature sensors (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000) or another transducers with a standard 0/4–20mA current loop signal
 - 4 x I, four inputs for connecting transducers with 0/4–20mA current loop signal
 - 3 x I/PULS, three digital inputs for connecting transducers with pulse output (range 0.001 Hz .. 10 kHz) or standard 0/4–20mA current loop signal
- ◉ 8 additional extra channels may be used for additional measurement of auxiliary process values or math operations (e.g. sum of flows, etc.)
- ◉ Additional quantities are omitted when performing calculations related to the flow measurement system
- ◉ Calculated quantities may serve as auxiliary values or be used directly in measurement systems
- ◉ The FP-3031 offers extended functions for recording measured and calculated values. Data are saved in a text file secured with an encrypted checksum and stored in the 2GB internal memory

EXAMPLE APPLICATION



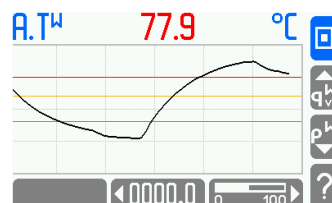
SCREEN EXAMPLES



A.WATER-STEAM [info icon]

P	4856.4	kW
$\Sigma_1 P$	001 453 378.2	MJ
$\Sigma_2 P$	0022 257.111	MJ
P ^D	5958.1	kW
P ^W	1101.8	kW

MORE [list icon] [list icon] [gear icon]



FP-3011, FP-3011N

Flow computer for calculating compensated flow and thermal energy of steam, water and other liquid media



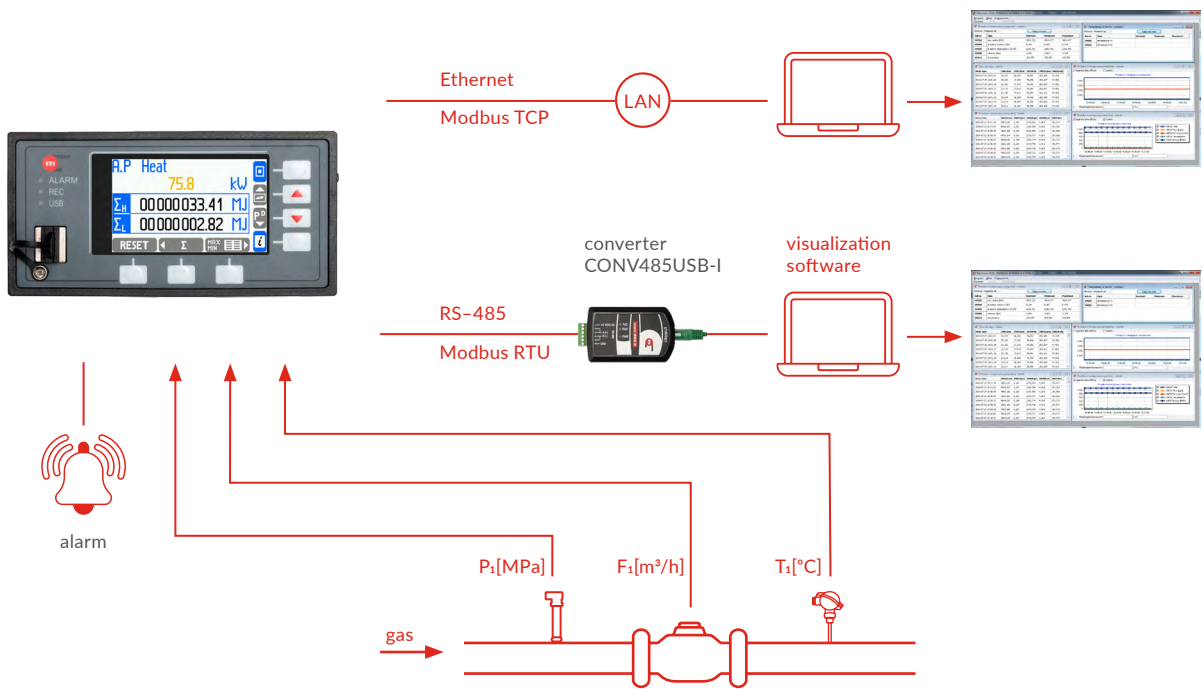
- ◉ Simultaneous flow and energy calculations in up to two different measurement applications (A, B) for separate process lines
- ◉ Flows and energy balancing
- ◉ 5 measurement inputs
- ◉ Alarm and control functions: 4 alarm and control thresholds for each channel
- ◉ 4 solid state relays (SSR) output relays: alarm and control functions, latched and non-latched mode, pulse output for totalizers
- ◉ Optional 4–20mA analogue output
- ◉ Colour graphic LCD TFT display
- ◉ USB port on the front panel, IP54 protected
- ◉ Ethernet Port (Modbus TCP, WWW server), RS-485 port (ASCII and Modbus RTU)
- ◉ Dedicated PC software for commissioning and archive data visualisation
- ◉ Two housing options: FP-3011 – panel mount and FP-3011N – wall mount
- ◉ Available languages: EN, DE, FR, PL
- ◉ The device has five measurement inputs:
 - 2 x RTD/I, three inputs for direct connecting resistive temperature sensors (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni1000) or another transducers with a standard 0/4–20mA current loop signal
 - 1 x I, four inputs for connecting transducers with 0/4–20mA current loop signal
 - 2 x I/PULS, three digital inputs for connecting transducers with pulse output (range 0.001 Hz .. 10 kHz) or standard 0/4–20mA current loop signal
- ◉ 8 additional channels: measurement of additional quantities or calculations.
- ◉ Additional quantities are omitted when performing calculations related to the flow measurement system.
- ◉ Calculated quantities may serve as auxiliary values or be used directly in measurement systems.
- ◉ The FP-3011 offers extended functions for recording measured and calculated values.
- ◉ Data are saved in a text file secured with an encrypted checksum and stored in the 2GB
- ◉ Internal memory.

INPUTS

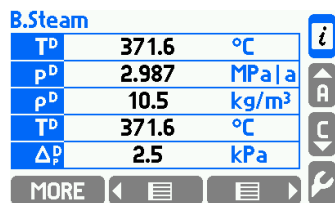
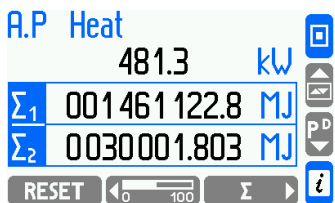
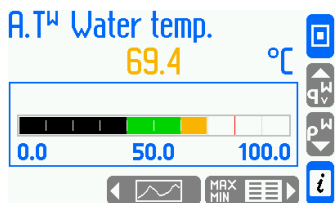
AUXILIARY MEASUREMENTS OR CALCULATIONS

RECORDING MEASUREMENT RESULTS

EXAMPLE APPLICATION



SCREEN EXAMPLES



FP-3021, FP-3021N

Flow computer for calculating compensated flow and thermal energy of steam, water and other liquid media



MEASUREMENT CHANNELS

HART

MOODBUS RTU

- ◉ Simultaneous flow and energy calculations in up to two different measurement applications (A, B) for separate process lines
- ◉ Flows and energy balancing
- ◉ 5 channels for digital data readout for process values
- ◉ Alarm and control functions: 4 alarm and control thresholds for each channel
- ◉ 4 solid state relays (SSR) output relays: alarm and control functions, latched and non-latched mode, pulse output for totalizers
- ◉ Optional 4–20mA analogue output
- ◉ Colour graphic LCD TFT display
- ◉ USB port on the front panel, IP54 protected
- ◉ Ethernet Port (Modbus TCP, WWW server), RS-485 port (ASCII and Modbus RTU)
- ◉ Dedicated PC software for commissioning and archive data visualisation
- ◉ Two housing options: FP-3021 – panel mount and FP-3021N – wall mount
- ◉ Available languages: EN, DE, FR, PL
- ◉ 5 channels dedicated for data readout from Modbus RTU protocol devices and HART protocol devices
- ◉ 2 binary input channels dedicated for measurement of frequency output type devices in range from 0.001 Hz to 10 kHz, pulse counting or state input tracking
- ◉ Readout of digital process values from transducer(s) over current loop signal in single or multidrop mode
- ◉ Operation as Primary Master or Secondary Master
- ◉ Readout of variables: PV – primary variable, SV – secondary variable, TV – third variable, FV – fourth variable
- ◉ Transducers or other devices connected in parallel to one twisted pair of wires (of an RS-485(1) port)
- ◉ Transmission baud rate from 1200 bps to 115200 bps
- ◉ Readout functions: 03 (Read Holding Register) and 04 (Read Input Register) supported
- ◉ Data formats: Unsigned Integer, Integer, Unsigned Long, Unsigned Long (swapped), Long, Long (swapped), Float, Float (swapped)

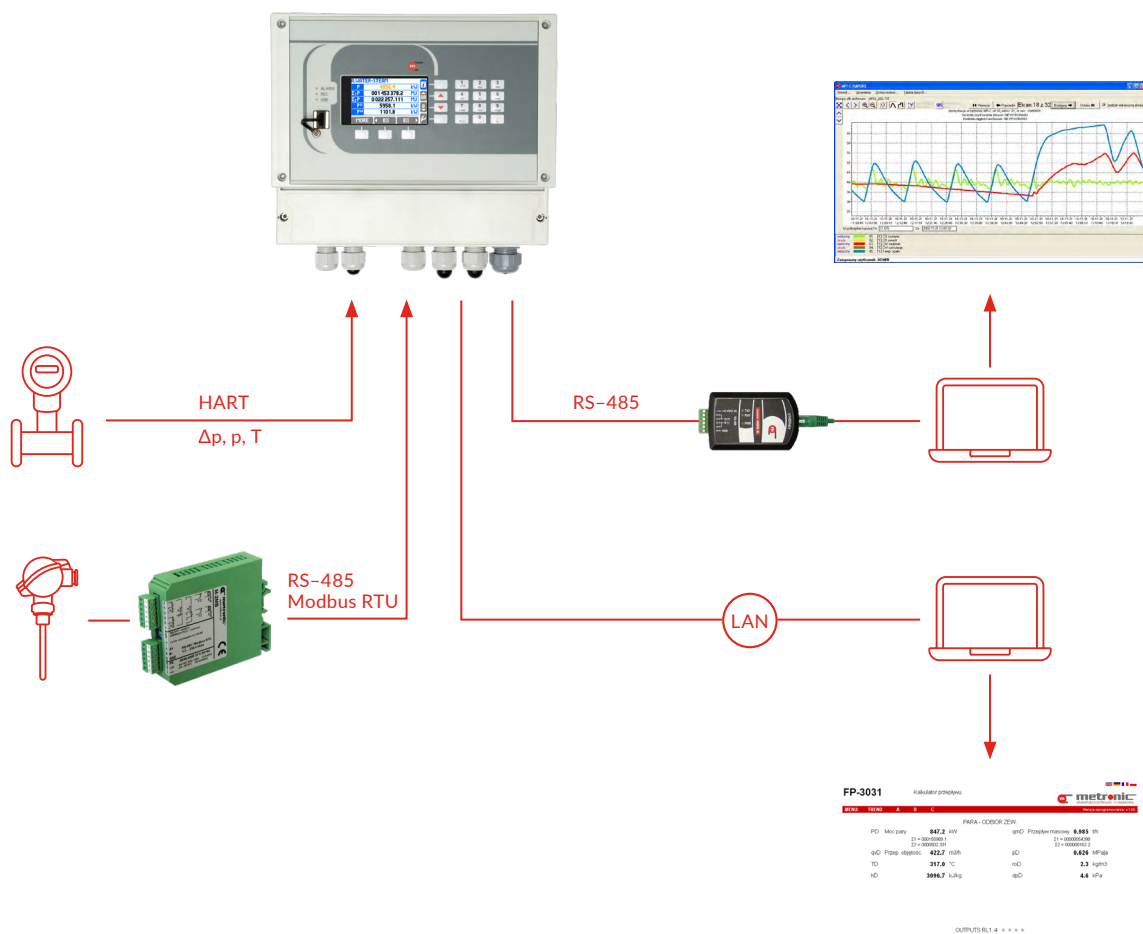
ADDITIONAL MEASUREMENTS AND CALCULATIONS

- 8 additional channels: measurement of additional quantities or calculations
- Additional quantities are omitted when performing calculations related to the flow measurement system
- Calculated quantities may serve as auxiliary values or be used directly in measurement systems

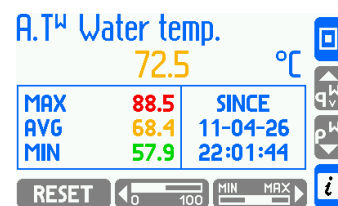
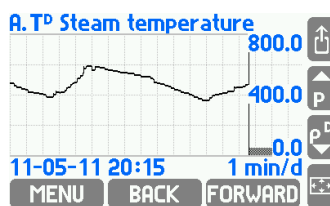
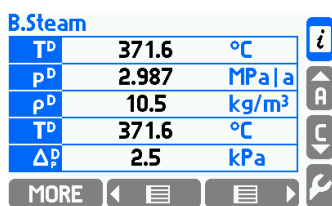
RECORDING MEASUREMENT RESULTS

- The FP-3021 offers extended functions for recording measured and calculated values. Data are saved in a text file, secured with an encrypted checksum and stored in the 2GB internal memory.

EXAMPLE APPLICATION



SCREEN EXAMPLES



FP4

Flow totalizer with data recording



APPLICATIONS

INPUTS

TOTALIZERS

OTHER FUNCTIONS

- 2 analogue inputs
- 2 PULS-type inputs
- 2 math channels
- 4–20mA analogue output
- 4 solid state relays (SSR) relay outputs
- USB port on the front panel
- Ethernet port, RS-485 port
- 4" Touchscreen colour LCD
- Internal 2 GB memory, advanced data recording
- Dedicated PC software for commissioning and archive data visualisation
- Available languages: EN, DE, ES, FR, PL, PT
- Measurement of flow and other quantities, e.g. temperature, humidity, pressure with the registration of results
- Operation in distributed measuring systems with local readings of measurement results.
- Grocery, steel, metallurgical, glass-making industry, warehouse and production line control
- 2 analogue inputs – for standard current loop 0/4–20mA signals or standard voltage signals in subrange range of –1 V .. +1 V or –10 V .. +10 V or direct connection of RTD temperature sensors (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni1000, Cu50, Cu53, Cu100, KTY81, KTY83, KTY84, linear 0 .. 2700 Ω)
- 2 PULS-type inputs – frequency measurement in range 0.01 Hz .. 10 kHz, pulse counting (for low frequency output flow meters), tracking and recording of binary open / close signals
- Two totalizers available for each channel
- The totalizers can be reset manually or automatically daily, weekly or monthly
- Work time counters for each channel
- Archiving rate from 1 min to 24 h
- Alarm or control mode
- 4 solid state relays rated at 0.1 A/60 V
- Alarm / Control functions, 2 thresholds for each channel RS-485 communication port (Modbus RTU)
- Ethernet port (Modbus TCP, WWW server)
- Calculation (math) channels – sum, difference, multiplication, division

CONV485E

RS-485 to Ethernet TCP/IP Converter

CONV485E enables data transmission between devices with RS-485 ports and devices operating in LAN networks or industrial Ethernet networks.



- ◉ 10BaseT ETHERNET port
- ◉ RS-485 port (2400 bps to 115200 bps)
- ◉ 2 modes of operation - Client and Server
- ◉ 2 protocols: 'Transparent' and Modbus TCP ↔ RTU gateway
- ◉ Conversion of Modbus TCP to Modbus RTU
- ◉ Support of up to 6 clients
- ◉ 5 LEDs for convertor operation indication
- ◉ Simple configuration through web browser
- ◉ 24 VDC / AC power supply
- ◉ Can be installed on standard TS-35 (DIN) rail

'TRANSPARENT' PROTOCOL

The convertor transmits the received string of characters between a LAN network and an RS-485 network.

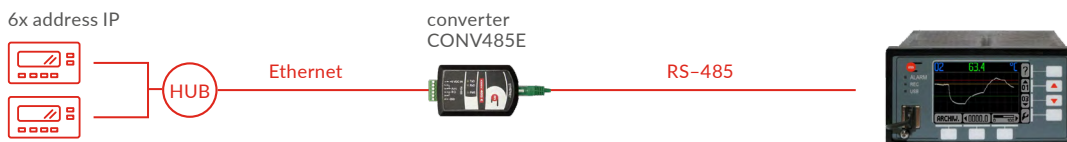
MODBUS TCP ↔ RTU PROTOCOL

The convertor receives query from a Modbus TCP protocol device, converts the frame to Modbus RTU protocol and sends the data to an RS-485 network and backwards transmits the response.

CLIENT MODE

The convertor enables data transmission between master systems operating in RS-485 networks and devices equipped with an Ethernet port.

EXAMPLE APPLICATION



SERVER MODE

The convertor enables data transmission between master systems operating in LAN networks with TCP/IP protocol and devices equipped with a RS-485 serial port.

EXAMPLE APPLICATION



CONV485USB-I, CONV485USB

RS-485 ↔ USB Converters



- ◉ Enables data transmission between devices with RS-485 port and PC with USB port
- ◉ USB port, compliant with USB 2.0
- ◉ CONV485USB convertor with no isolation, for test and laboratory use
- ◉ CONV485USB-I convertor with isolation, for laboratory and industrial applications
- ◉ Converter may be used as a COM device on PC, allowing use software designed for COM ports
- ◉ LEDs indicating Power ON, Rx, Tx
- ◉ CONV485USB-I may be also installed on standard TS-35 (DIN) rail

mLog

Software for data acquisition with database



- ◉ On-line process data presentation from one or more measuring devices (table, single values, chart, bar graph)
- ◉ Data recording into the database
- ◉ Presentation of archived data in form of tables and charts
- ◉ Export archived data to the *.csv format
- ◉ Modbus TCP and Modbus RTU protocols
- ◉ Event log containing error messages
- ◉ Available languages: EN, ES, FR, PL

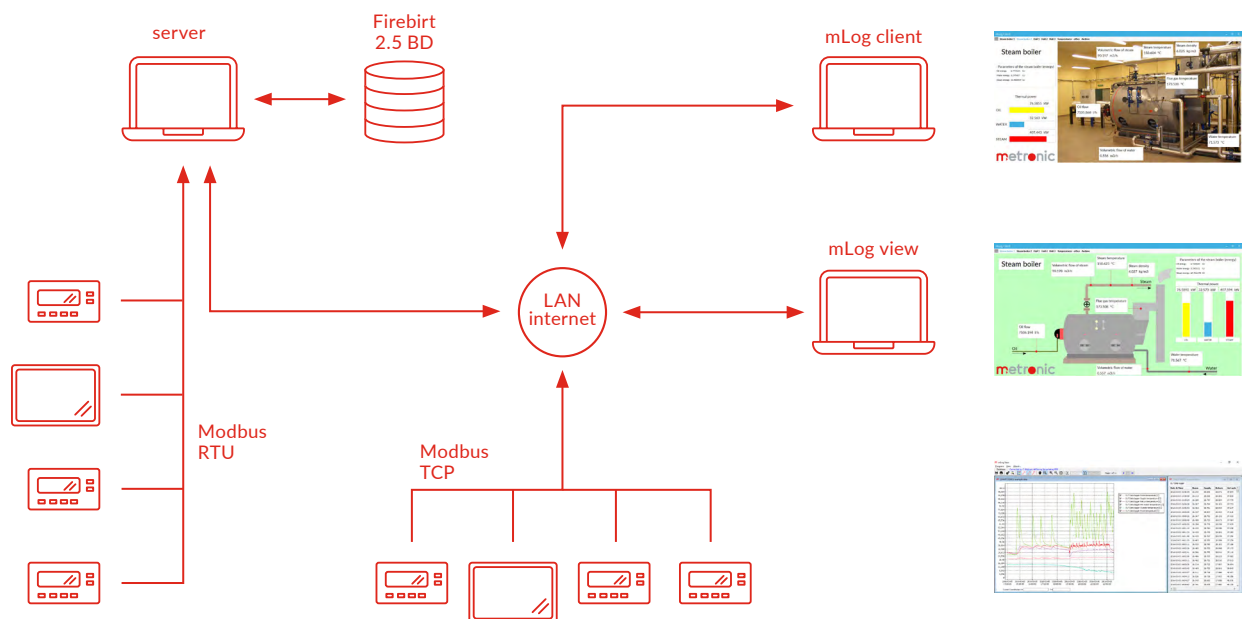
VISUALIZATION AND ARCHIVING DATA

MODBUS RTU/ MODBUS TCP

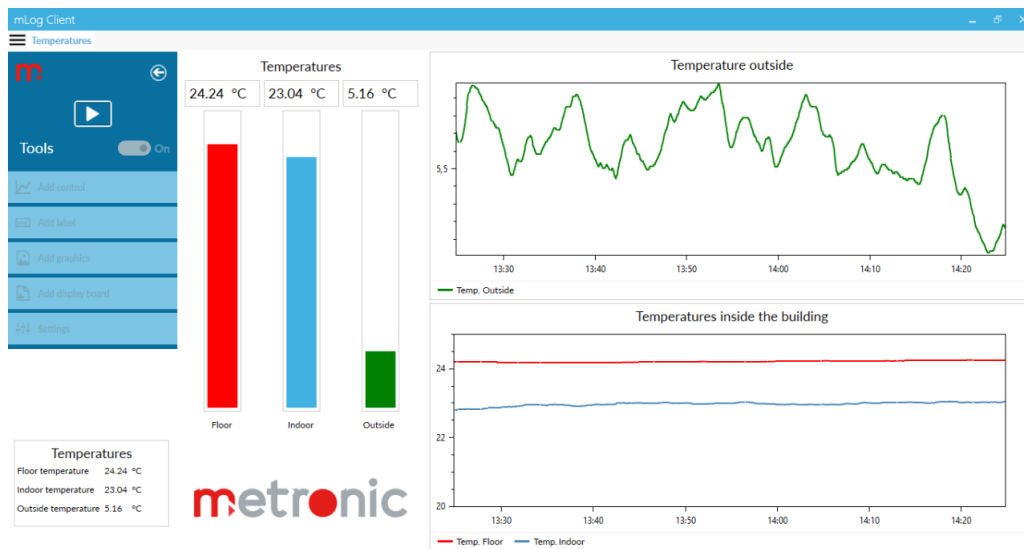
SOFTWARE ACTIVATION

- ◉ mLog Server: reading data from devices and transducers in Modbus RTU/TCP protocol, data recording into the database (Firebird 2.5), information about the status of communication
- ◉ mLog Client: on-line visualization of process values (table, single values, chart, bar graph, possibility of adding additional own graphic)
- ◉ mLog View: reading archived data from the database (from the date to the date), visualization (table, chart), export the table to the *.csv format, export the chart to the *.bmp, *.jpg, *.pdf or *.html format
- ◉ Functions: 04 – Read Input Registers, 03 – Read Holding Registers
- ◉ Data formats: unsigned integer 16b, signed integer 16b, unsigned integer 32b, unsigned integer 32b swapped, signed integer 32b, signed integer 32b swapped, floating point 32b, floating point 32b swapped, signed integer 64b, floating point 64b
- ◉ Baud rate: 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbps (Modbus RTU)
- ◉ Parity: None + 1 bit stop, None + 2 bit stop, Even, Odd (Modbus RTU)
- ◉ The software requires activation (registration). After purchasing, programs are available:
 - mLog Server – Single user
 - mLog Client – No limit of users
 - mLog View – No limit of users

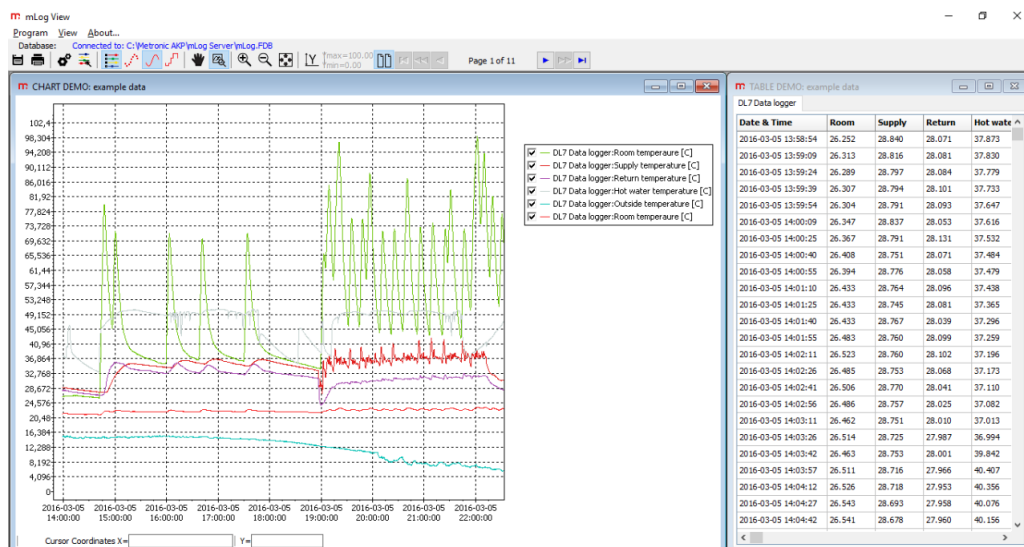
BLOCK DIAGRAM OF SOFTWARE OPERATION



APPLICATION WINDOW mLog Client

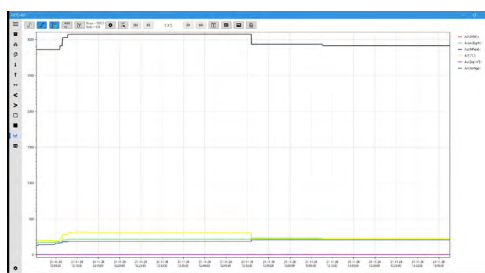


APPLICATION WINDOW mLog View



REPORT SOFTWARE

- Dedicated software for Metronic AKP recorders
- Remote on-line process values readout
- Remote archive data retrieve
- Visualisation and analysing of archived data on PC
- Viewing results as graphs (charts) and tables
- Selecting data, averaging results, searching for minimum and maximum values
- Verifying measurement results: data encryption and archive continuity control
- Reports printing



Date	Time	DNF	AP (MPa)	Agn (kg/s)	Ap (kg/s)	AJ (%)	Ap (kg/s)	AJ (kg/s)	AJ (kg/s)
21-11-26	12:00:04	0	0.13	162.21	135.66	194.02	0.65	2063.71	
21-11-26	12:00:05	0	0.13	162.21	135.66	194.04	0.65	2063.74	
21-11-26	12:00:06	0	0.13	162.20	135.66	194.01	0.65	2063.68	
21-11-26	12:00:07	0	0.13	162.21	135.66	194.01	0.65	2063.69	
21-11-26	12:00:08	0	0.13	162.21	135.65	194.06	0.65	2063.79	
21-11-26	12:00:09	0	0.13	162.21	135.66	194.02	0.65	2063.79	
21-11-26	12:00:10	0	0.13	162.21	135.66	194.01	0.65	2063.69	
21-11-26	12:00:11	0	0.13	162.21	135.66	194.01	0.65	2063.69	
21-11-26	12:00:12	0	0.13	162.21	135.66	194.00	0.65	2063.56	
21-11-26	12:00:13	0	0.13	162.21	135.66	194.03	0.65	2063.72	
21-11-26	12:00:14	0	0.13	162.21	135.66	194.03	0.65	2063.72	
21-11-26	12:00:15	0	0.13	162.21	135.66	194.00	0.65	2063.67	
21-11-26	12:00:16	0	0.13	162.21	135.66	194.03	0.65	2063.72	
21-11-26	12:00:17	0	0.13	162.21	135.67	194.02	0.65	2063.80	
21-11-26	12:00:18	0	0.13	162.20	135.66	194.08	0.65	2063.82	

Date	Time	AP (MPa)	45x45 [°C]	45x45 [°C]	45x45 [°C]	45x45 [°C]	
21-11-26	12:00:04	0.13	31.2	31.2	31.0	30.9	30.2
21-11-26	12:00:05	0.13	31.2	31.2	31.0	30.7	30.1
21-11-26	12:00:06	0.13	31.4	31.4	31.1	30.7	30.1
21-11-26	12:00:07	0.13	31.4	31.4	31.1	30.7	30.1
21-11-26	12:00:08	0.13	31.3	31.3	31.0	30.7	30.2
21-11-26	12:00:09	0.13	31.3	31.3	31.0	30.7	30.2
21-11-26	12:00:10	0.13	31.4	31.4	31.1	30.8	30.2
21-11-26	12:00:11	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:12	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:13	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:14	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:15	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:16	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:17	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:18	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:19	0.13	31.4	31.4	31.1	30.8	30.1
21-11-26	12:00:20	0.13	31.3	31.3	31.0	30.7	30.0
21-11-26	12:00:21	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:22	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:23	0.13	31.3	31.3	31.0	30.7	30.0
21-11-26	12:00:24	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:25	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:26	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:27	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:28	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:29	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:30	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:31	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:32	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:33	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:34	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:35	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:36	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:37	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:38	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:39	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:40	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:41	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:42	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:43	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:44	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:45	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:46	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:47	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:48	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:49	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:50	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:51	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:52	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:53	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:54	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:55	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:56	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:57	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:58	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:00:59	0.13	31.3	31.3	31.0	30.6	30.0
21-11-26	12:01:00	0.13	31.3	31.3	31.0	30.6	30.0

Device type	FP90	Serial number	20100000	Firmware version	0.0.0.8
Device ID	1	Archive type	DMA	CRC	
Beginning of archive	21-11-26 12:00:24	Archive ending	21-11-26 13:37:32	Number of records	5029
Check all	Check selected	Check unselected			
Symbol	Description	Unit			
AP	MPa	MPa			
Agn	kg/s	kg/s			
Ap	kg/s	kg/s			
AJ	%	%			
AJ	kg/s	kg/s			
AK	kg/s	kg/s			

