Product Catalog

8th edition

Data loggers
Flow computers
Converters
Softwares

metronic

TABLE OF CONTENTS

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 areconstantly 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.

T/F: (+48) 12 312 16 80, M: (+48) 695 378 563, (+48) 783 858 063, e-mail: biuro@metronic.pl

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 tran ducers, 0/4–20mA current loop transducers and 0.001 Hz to 10 kHz pulse output transducers. Some de-vices 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 opera-tions 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, hu-midity, pressure) with local readout and data transmission to a supervis-ing 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	DL5	DL7
Number of inputs / outputs	3 to 12 (depends on number of installed I/O modules)	3 to 30 (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	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)	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	ethernet port, RS-485 port
Number of available slots for I/O modules	2	5	7
Display	colour graphic LCD 4” + Touchscreen	colour graphic LCD 5” + Touchscreen	colour graphic LCD 7” + Touchscreen
Communication ports (transmission protocol)	RS-485 (Modbus RTU), Ethernet (Modbus TCP, WWW server)	RS-485 (Modbus RTU), Ethernet (Modbus TCP, WWW server)	RS-485 (Modbus RTU), Ethernet (Modbus TCP, WWW server)
Housing version	panel mount, wall mount	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
- Modbus TCP Client/Server, Modbus RTU Slave, WWW server
- Archive preview on display
- Extensive math channels
- 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 Type A port
- Ethernet port
- RS-485 port
- 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)

- IN3D - three binary inputs for status tracking, frequency measurement (0.1 .. 12 500 Hz), pulse counting (0 .. 100 Hz) with the possibility of powering transducers
- 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)

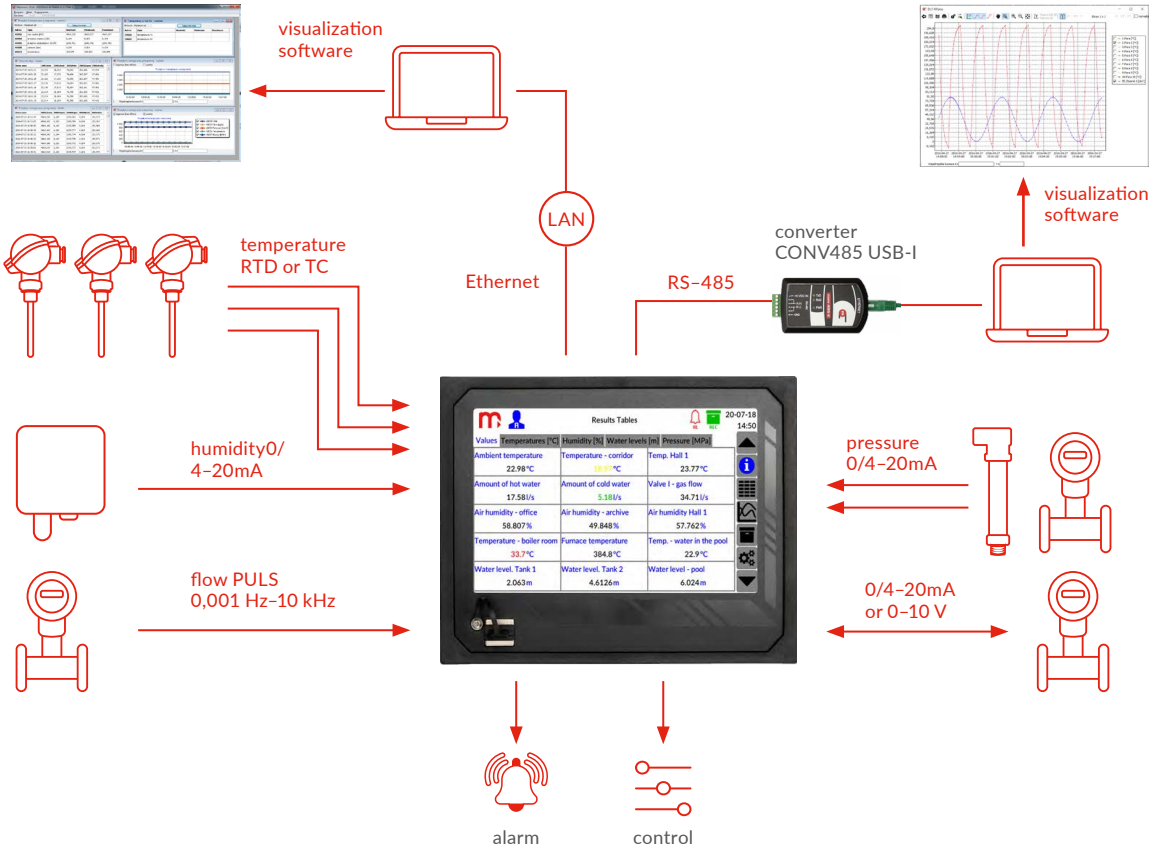
RECORDING MEASUREMENT RESULTS

- 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

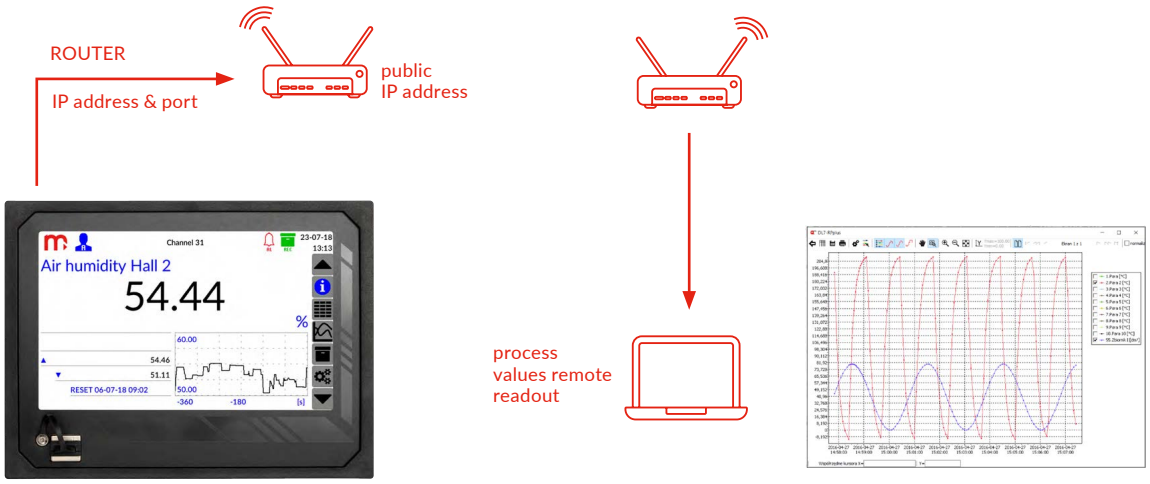
OTHER FUNCTIONS

- 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
- Set value – possibility of entering a constant value in the channel
- 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 current and totalizer 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



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.

DL5

Multichannel electronic data logger

- 3 to 42 measuring inputs
- Up to 100 displayed channels
- 5”Touchscreen colour LCD
- Internal 2 GB memory, advanced data recording
- USB port on the front panel, IP54 protected
- Modbus TCP Client/Server, Modbus RTU Slave, WWW server
- Archive preview on display
- Extensive math channels
- Dedicated PC software for commissioning and archive data visualisation

DL5 is a modular data recorder, developed for wide range of applications and process measurements. Its modular construction and available up to thirty different I/O inputs, allows to configure customized meas rement system.
The device is intended to measure process signals in industrial applications and may be used to measure physical values processed into a standard signals, e.g. temperature, humidity, pressure, flow, level and chemical parameters, etc. The device is perfectly suited for slow rate variable runs with changes at a few seconds intervals.

BASE MODULE M

- USB Type A port
- Ethernet port
- RS-485 port
- 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 V / 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)
- IN3D - three binary inputs for status tracking, frequency measurement (0.1 .. 12 500 Hz), pulse counting (0 .. 100 Hz) with the possibility of powering transducers
- 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

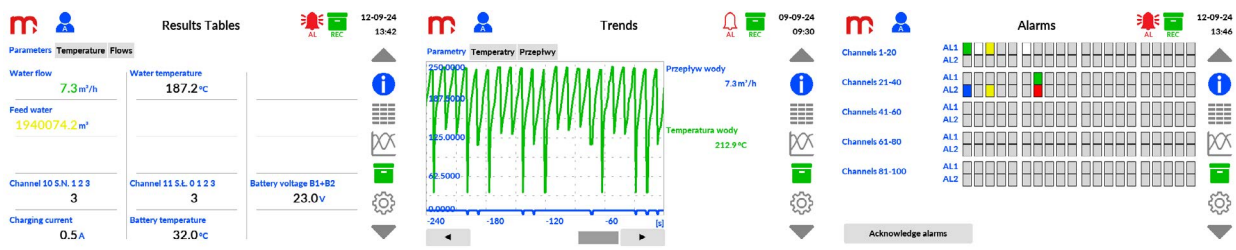
RECORDING MEASUREMENT RESULTS

- 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 channel
- Totalizers – two totalizers for each of the one hundred channels
- Tracking minimum and maximum value of each channel
- Set value – possibility of entering a constant value in the channel
- 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 current and totalizer values (up to 5 recipients)
- Print Screen option to a bmp file
- Event Log

EXAMPLE DATA PRESENTATION



DL5W KIT

Wall enclosure for DL5 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 DL5W KIT enables the installation of the DL5 data logger indoor or outdoor.

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
- Modbus TCP Client/Server, Modbus RTU Slave, WWW server
- Extensive math channels
- 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
- RS-485 port
- 4 alarm / control relays (SSR type)
- 24 VDC device power supply input
- 4-20mA analogue output

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)
- IN3D - three binary inputs for status tracking, frequency measurement (0.1 .. 12 500 Hz), pulse counting (0 .. 100 Hz) with the possibility of powering transducers
- 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
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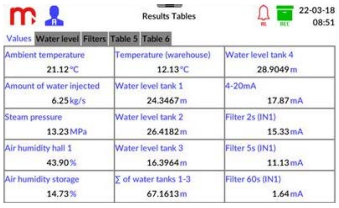
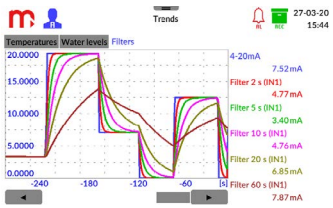
- Checksum secured files – protection against data manipulations

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
- 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 current and totalizer values (up to 5 recipients)
- Print Screen option to a bmp file
- Event Log

EXAMPLE DATA PRESENTATION





DL2W KIT

Wall enclosure for DL2 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 DL2W KIT enables the installation of the DL2 data logger indoor or outdoor.

IM80

8 channel analog input module

- 8 analog inputs RTD / TC / I / U / R
- 72 measurement channels
- Port RS–485, Modbus RTU Slave
- Port RS–485, Modbus RTU Master (optional)
- Advanced data recording in internal memory (optional)
- Display LCD 2x16 characters
- Port USB C on the front panel
- Configuration software
- Mounting on the TS-35 rail

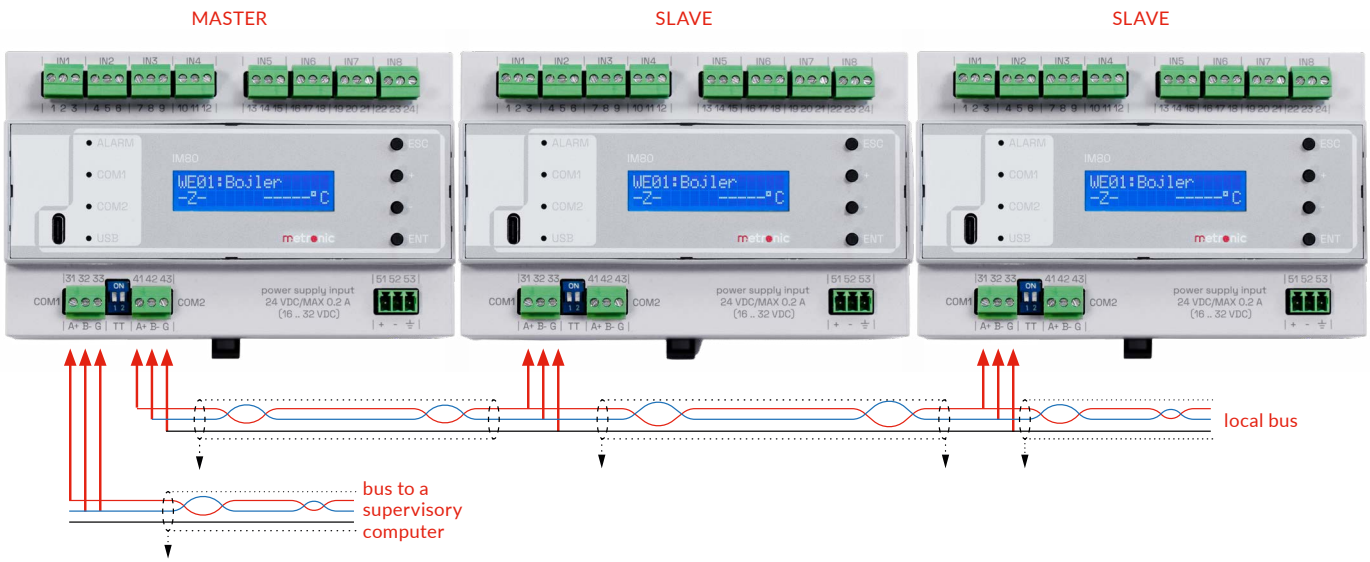
The IM80 is a precision programmable analog input module designed for use in a distributed measurement or control system. Eight measurement channels allow the connection of RTDs, TC thermocouples, or 4-20mA current signals. The input signals are processed in an 18-bit A/D converter. The data received from the transmitter is digitally linearized and processed by the microprocessor system, and then made available to the master system via the COM1 (RS-485 / Modbus RTU) SLAVE communication port. The second COM2 (RS-485 / Modbus RTU) MASTER communication port allows you to connect additional IM80 modules to increase the number of measurement channels.

The device is designed to measure process signals in industrial installations and can be used to measure physical quantities converted into a standard signal, such as: temperature, humidity, pressure, flow, level, chemical composition, etc.

BASIC FEATURES

- Measurement of process variables in 8 channels
- Remote readout in 64 channels
- Data and event registration
- Communication with the superior computer system
- Reading parameters from modules in the local network

EXAMPLE APPLICATION



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 00C to 8000C and an absolute pressure range of 0.05MPa to 16.52MPa. 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.

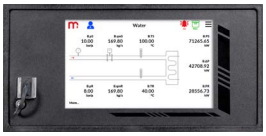
FLOW COMPUTERS – GENERAL FEATURES COMPARISON

	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, function +, -, /, *, √, ^	Yes, function +, -, /, *, √, ^
Analogue outputs (optional)	Minimum 1	1 or 2
Display	Colour graphic LCD 4'' + Touchscreen	Colour graphic LCD 7'' or 5" + Touchscreen
Communication ports (transmission protocol)	RS-485 (Modbus RTU), Ethernet (Modbus TCP, WWW server)	RS-485 (Modbus RTU), Ethernet (Modbus TCP, server WWW)
Panel mount version dimensions	144 x 72 x 130	192 x 96 x 63,5

	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 lub 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

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 (+, -, /, *, √)
- 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

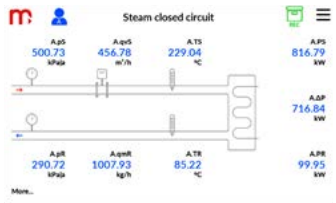
ALARMS AND CONTROL

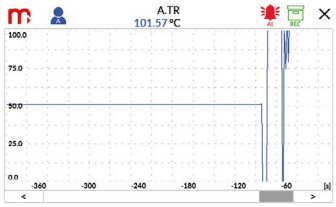
- 2 alarm thresholds for each result
- Alarm or control mode, signaling failure of sensors connected to analogue inputs
- 4 solid state relays rated at 0.1 A/60 V
- E-mails regarding alarm states and cyclical reports with current and totalizer values (up to 5 recipients)

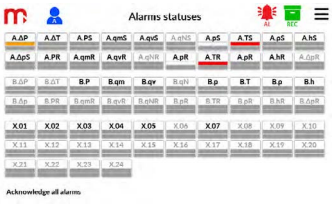
RECORDING MEASUREMENT RESULTS

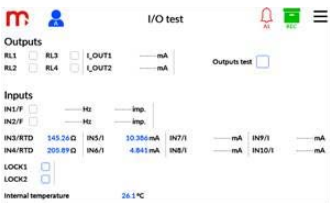
- Archive files: process values (recording rate from 3 s up to 24 h)
- Event files: authorization log file, event log file, settings log file (recording after the occurrence of the event)
- 2 recording rates, toggled by alarm state for shorting/opening time of selected binary inputs
- Access to recorded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

EXAMPLE DATA PRESENTATION

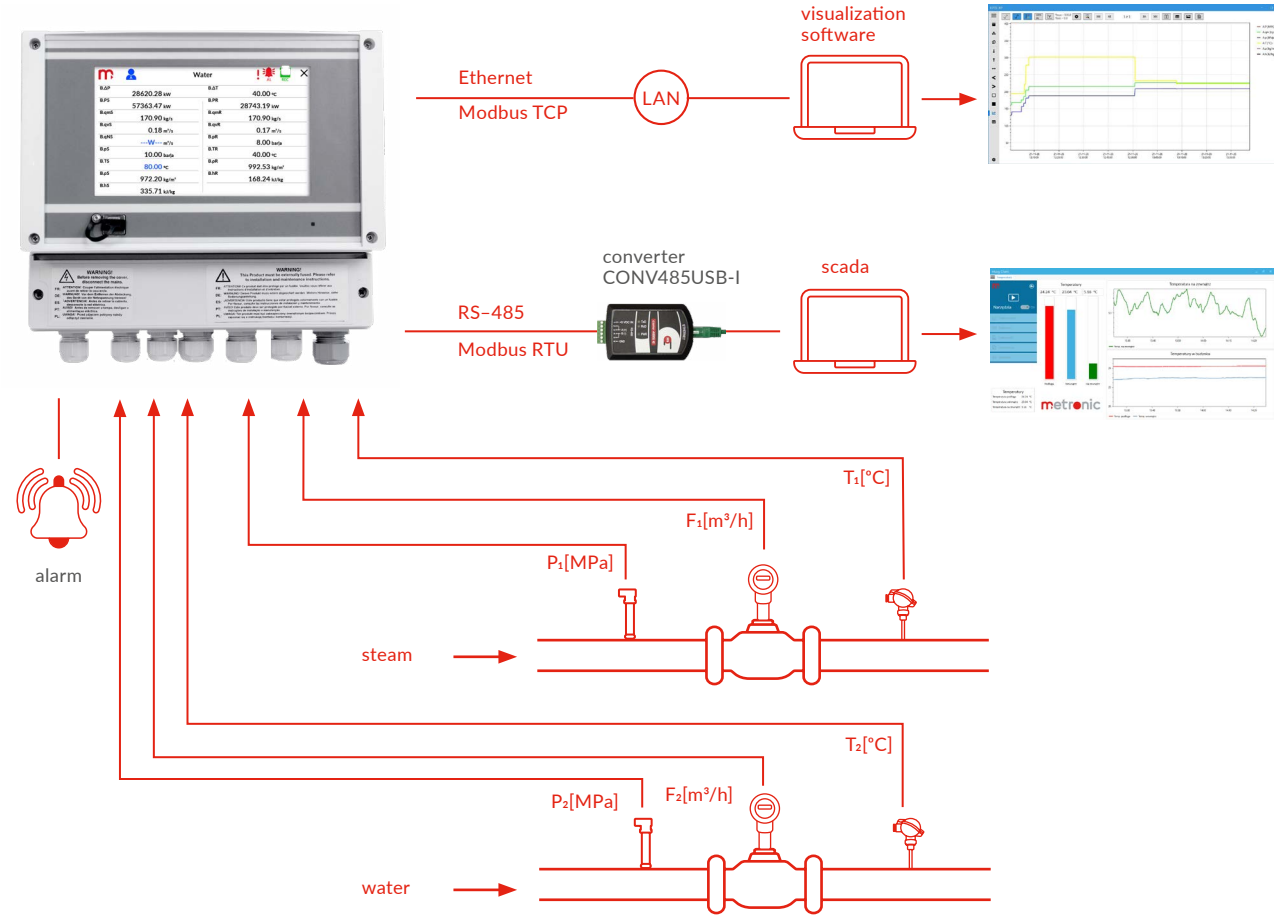




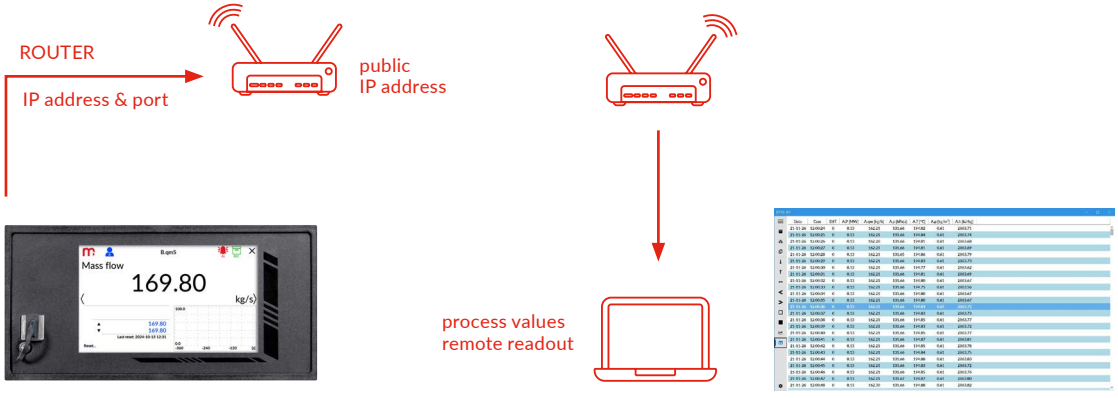




EXAMPLE APPLICATION



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 (+, -, /, *, √)
- 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

BASE MODULE M

- Ethernet port
- RS-485 port
- 4 alarm / control relays (SSR type)
- 24 VDC device power supply input
- 4-20mA analogue output

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)
- IN3D - three binary inputs for status tracking, frequency measurement (0.1 .. 12 500 Hz), pulse counting (0 .. 100 Hz) with the possibility of powering transducers
- 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)

AUXILIARY CHANNEL

- 16 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
- 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)

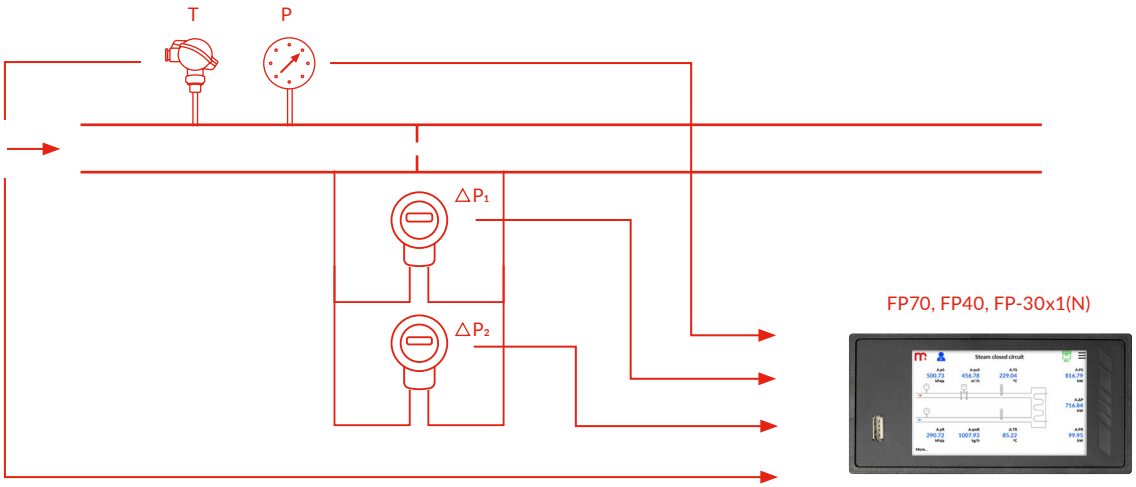
RECORDING MEASUREMENT RESULTS

- 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

EXAMPLE APPLICATION

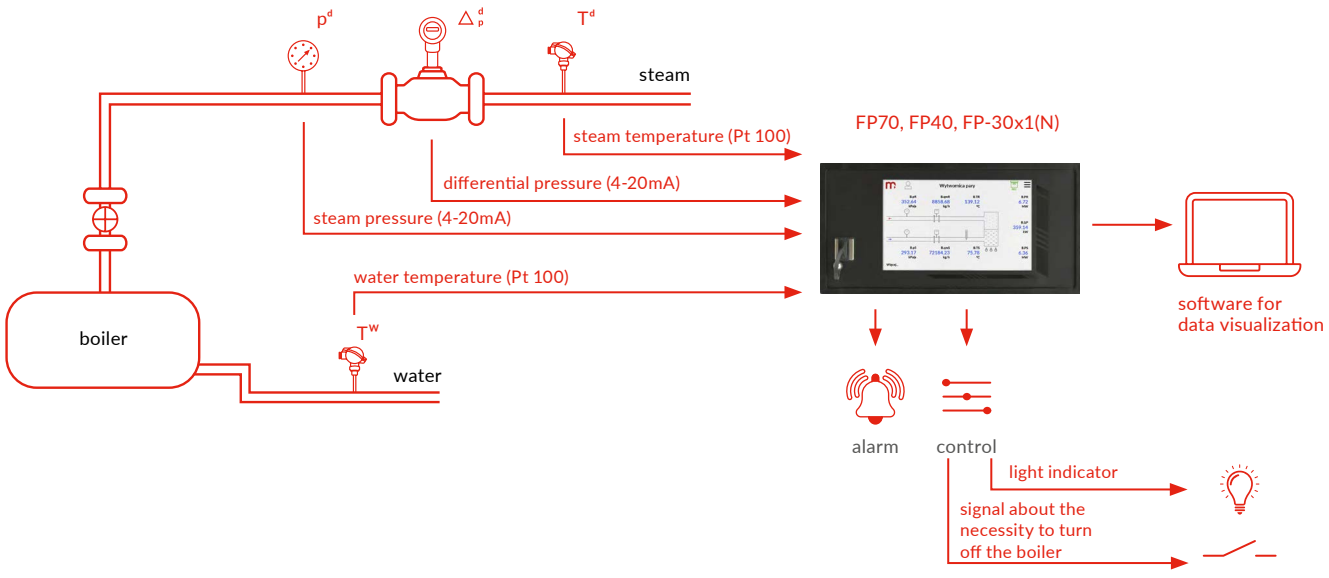
Flow computer with two differential pressure transmitters application

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 fulfillment 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

- 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

INPUTS

- 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

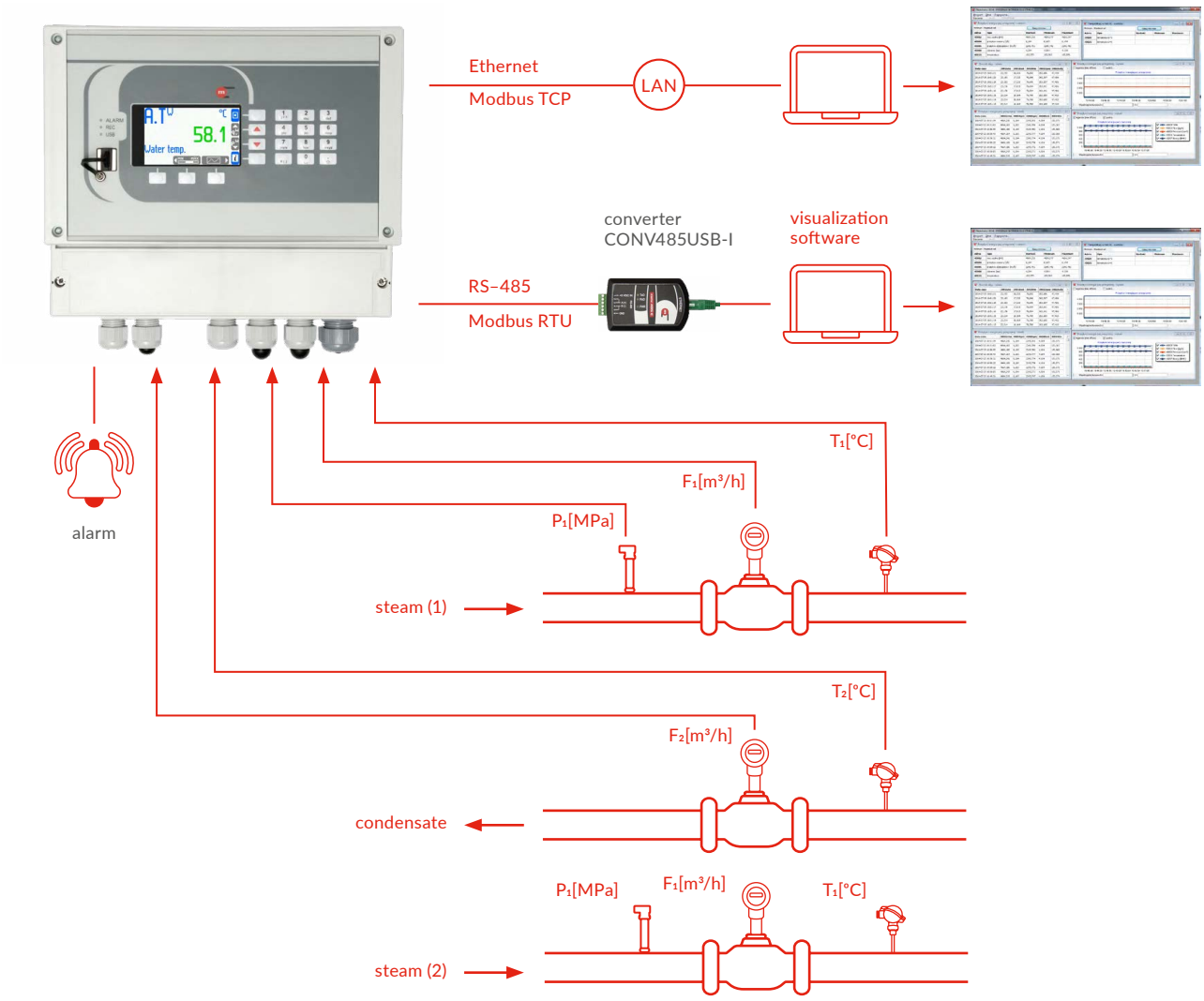
AUXILIARY MEASUREMENTS OR CALCULATIONS

- 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

RECORDING MEASUREMENT RESULTS

- 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



EXAMPLE DATA PRESENTATION

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

INPUTS

- 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

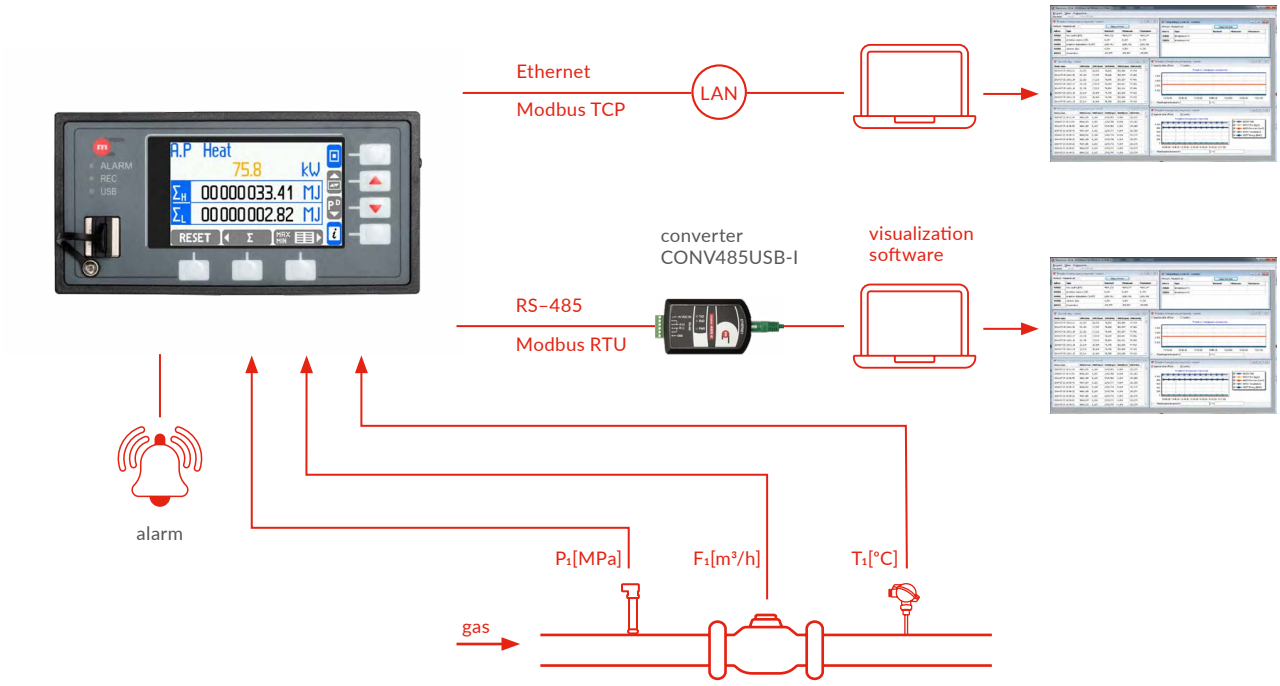
AUXILIARY MEASUREMENTS OR CALCULATIONS

- 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.

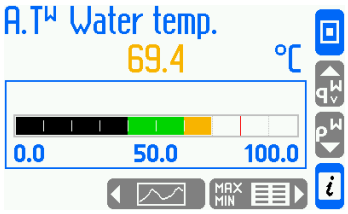
RECORDING MEASUREMENT RESULTS

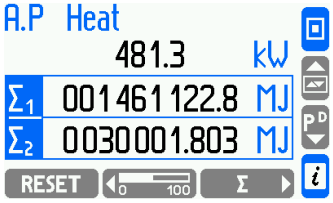
- The FP-3011 offers extended functions for recording measured and calculated values. Data are saved in a text file secured with an encrypted checksum and stored in the 2GB Internal memory.

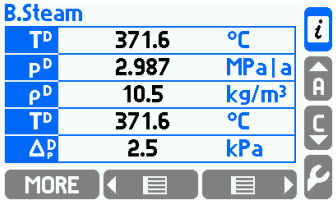
EXAMPLE APPLICATION



EXAMPLE DATA PRESENTATION







FP-3021, FP-3021N

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 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

MEASUREMENT CHANNELS

- 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

HART

- 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

MODBUS RTU

- 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)

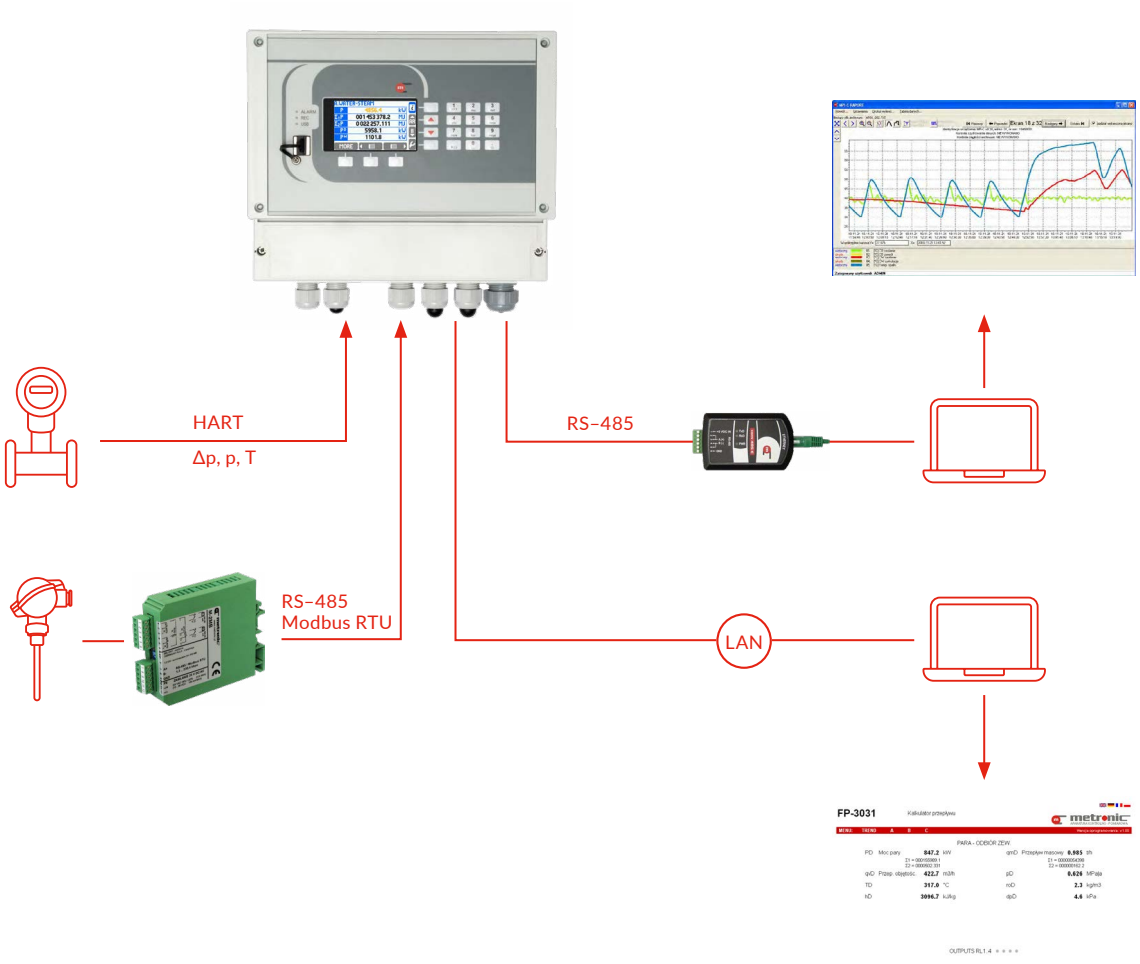
ADDITIONAL MEASUREMENTS AND CALCULATIONS

- 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

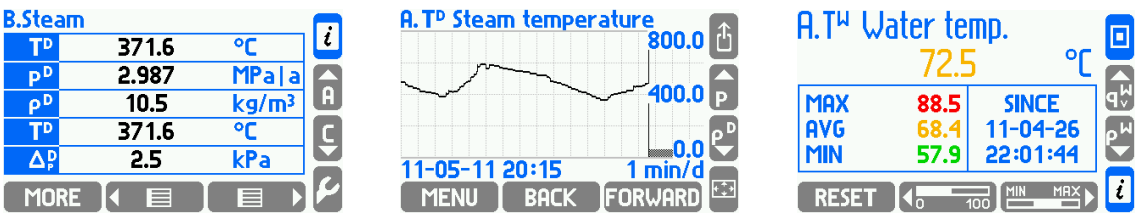
RECORDING MEASUREMENT RESULTS

- 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



EXAMPLE DATA PRESENTATION



FP4

Flow totalizer with data recording

- 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

APPLICATIONS

- 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

INPUTS

- 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

TOTALIZERS

- 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

OTHER FUNCTIONS

- 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 backwords 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

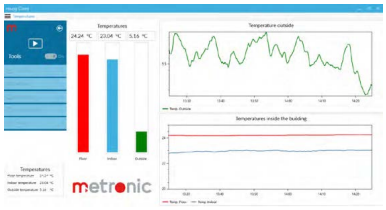
CONV485USB-I, CONV485USB

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

- 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

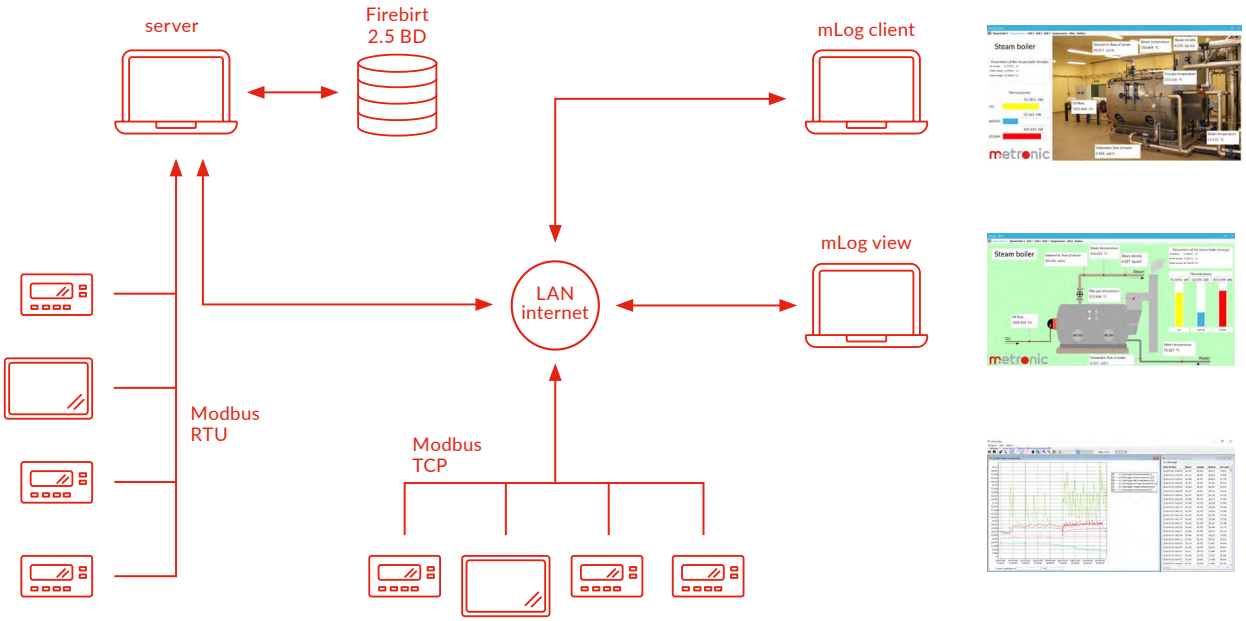
MODBUS RTU/ MODBUS TCP

- 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)

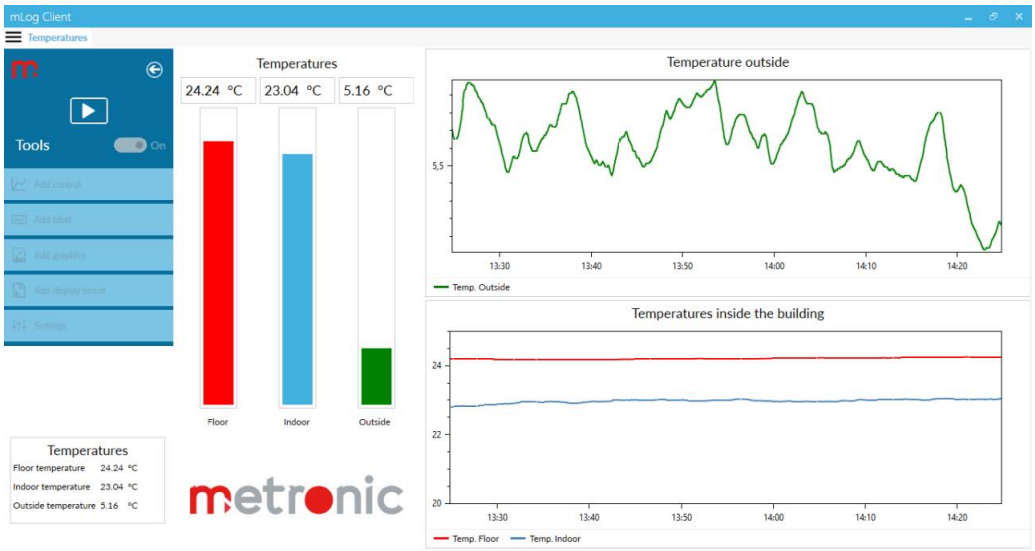
SOFTWARE ACTIVATION

- 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

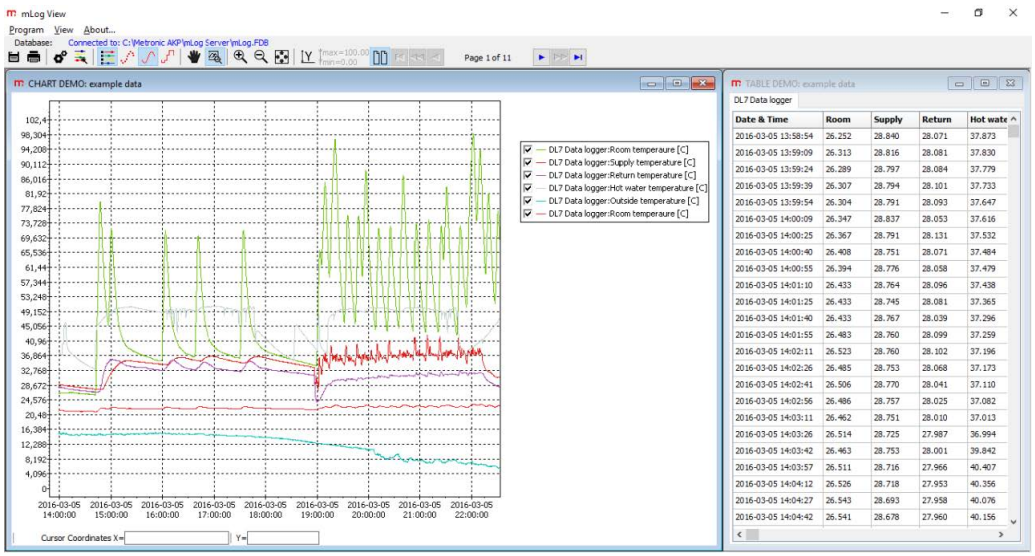
BLOCK DIAGRAM OF SOFTWARE OPERATION



APPLICATION WINDOW mLog Client



APPLICATION WINDOW mLog View



33

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