



MPI-C MPI-CL MPI-CN

MULTICHANNEL ELECTRONIC RECORDER

16 analog channels, 4 digital channels, 16 math channels



- 16 universal analog inputs
- 4 digital inputs
- 16 math channels
- 8 relay outputs for alarm or control functions
- 2 GB internal flash memory, advanced data logging
- Graphical color LCD TFT display
- USB port on the front panel with IP54 protection
- Ethernet port: Modbus TCP protocol, Web Server
- RS-485: ASCII and Modbus RTU protocol
- GSM module (option)

16 UNIVERSAL ANALOG INPUTS FOR TEMPERATURE SENSORS OR OTHER TRANSMITTERS:

- RTD sensors type Pt-100 and Ni-100 and its multiples (such as Pt-200).
- TC sensors J, L, M, T, U, E, N, B, R and S.
- transmitters with output in the current loop 4-20mA or 0-20mA standard.
- transmitters with an output resistance in the range 0 ... 5000 Ω .
- converters with voltage output of -0.8 V ... 0.8 V.

The inputs are **galvanically isolated** from each other. **Digital filter** with selectable time constant allows the measurement of noisy signals.

4 DIGITAL INPUT:

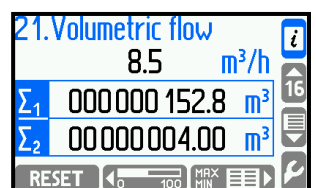
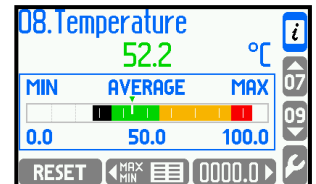
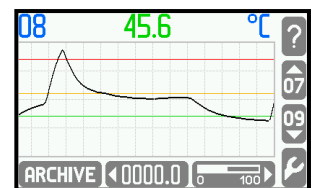
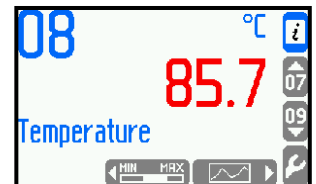
- Measurement frequency range **0.001 Hz to 10 kHz**.
- Pulse counting.
- Tracking and recording a **binary signal** (short or open circuit).

16 CALCULATED VALUES:

- Available functions: addition, subtraction, multiplication, division, square roots on measured or calculated channels.

ARCHIVING RESULTS:

- Writing to internal 2GB memory.
- Protected files with the encrypted checksum.
- Recording frequency from 5 s to 24 h; possible to define two switched frequencies depending on alarm threshold state.





8 RELAY OUTPUTS, THRESHOLD ALARM-CONTROL:

- 8 solid-state relay outputs rated at 0.1 A / 60 V.
- Up to 4 alarm thresholds for each channel.

COMMUNICATION WITH THE MASTER SYSTEM:

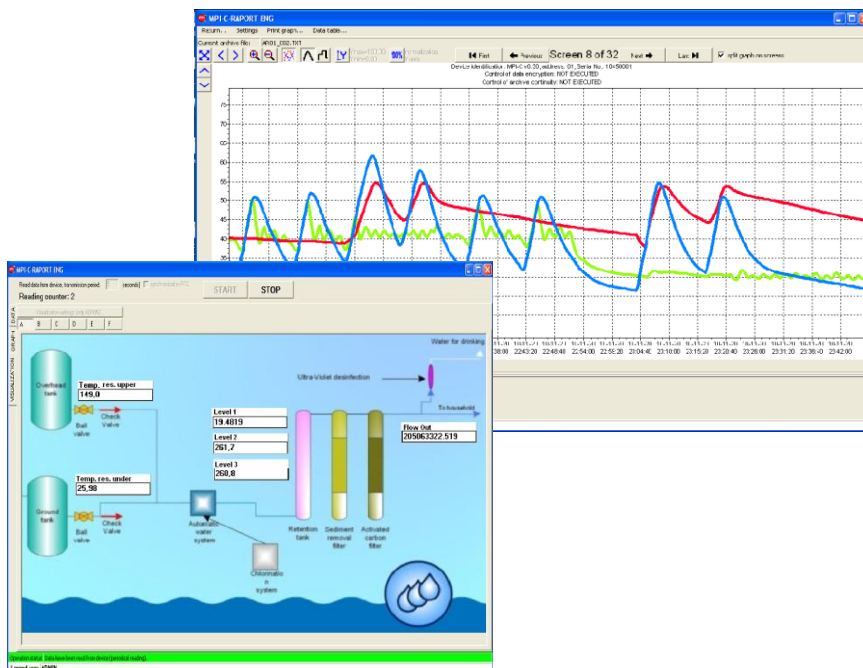
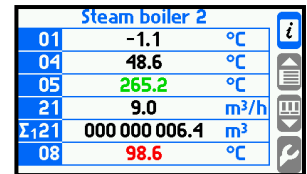
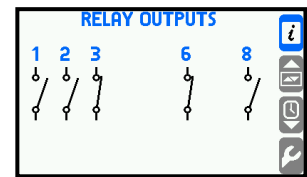
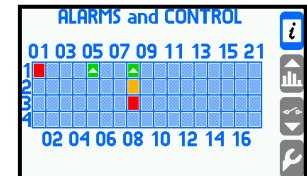
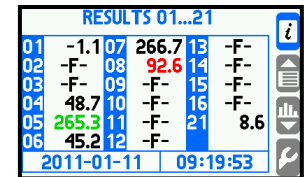
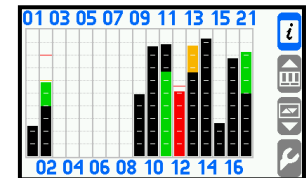
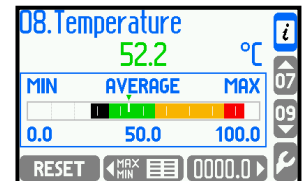
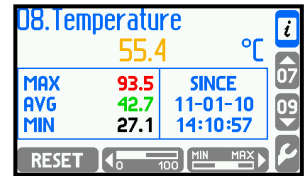
- RS-485 port, ASCII and Modbus RTU protocol.
- Ethernet port, Modbus TCP, Web Server.
- GSM module (option), SMS notification about alarms, counters and current values.

OTHER FEATURES:

- USB port on the front panel for data and setting transfer.
- Counters for each flow value channel (measured or calculated).
- Tracking the value of minimum, maximum and average for each of the measured and calculated channel.
- Advanced system of users and passwords.
- Event log.
- The register of authorized activities.
- Three types of case: MPI-C – panel housing, MPI-CL – portable housing, MPI-CN – wall-mount housing.
- Language versions: Polish, English, French, German.

VIEWING THE RESULTS:

- Graphic LCD TFT color display, the dimensions of 43,8 mm to 77,4 mm, resolution 272 x 480 px.
- Three two colour LEDs.
- Change in display color when alarms activated.
- Dedicated software for visualization of measurement results.



Device version: MPI-C v1.29 Data sheet version: 2016-07-15



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TECHNICAL DATA

FRONT PANEL	
Type of display:	Graphic LCD TFT 272 x 480 points.
Reading field size:	43,8 mm x 77,4 mm
LED signal diodes :	3 two-colour, green-red
Keyboard:	Membrane, 7 or 19 buttons (MPI-CN and MPI-CL)
ANALOG INPUTS	
Number of inputs:	16 multiplexed with signal relays
Galvanic separation between channels:	Yes, 100 VDC or 100 V _{p-p}
Galvanic separation from supply voltage:	Yes, 500 VDC or 500 V _{p-p}
RTD inputs	
Sensor type :	(see table below)
Current:	200 μ A
Connection:	3-wire or 2-wire
Wire resistance compensation in the 3-wire connection:	Automatic + constant within the range of -99,99 Ohm up to 99,99 Ohm
Wire resistance compensation in the 2-wire connection:	Constant within the range of -99,99 Ohm to 99,99 Ohm
Maximum resistance of wires (to the sensor):	50 Ohm
Resistance input	
Sensor type :	Resistance within the range of 0-5000 Ohm ⁽²⁾
Conversion characteristic:	Linear / User-defined
Current:	200 μ A
Sensor connection type:	3-wire or 2-wire
Wire resistance compensation in the 3-wire connection:	Automatic + constant within the range of -99,99 Ohm to 99,99 Ohm
Wire resistance compensation in the 2-wire connection:	Constant within the range of -99,99 Ohm to 99,99 Ohm
Maximum resistance of wires supplying power to the sensor:	50 Ohm
TC inputs	
Sensor type:	(table below)
Cold junction compensation:	Any other temperature measuring channel (in °C) or constant value, for thermocouple B – no compensation
Cold junction compensation range:	-50,0° C to +99,9° C
Maximum input voltage:	30 VDC or 30 V _{p-p} (between any of +TC i -TC clamps)
Maximum resistance of compensation wires (connected to the TC sensor):	As RTD
Voltage input	
Sensor type:	-0,8 V to +0,8 V ⁽³⁾
Conversion characteristic:	Linear / User-defined
Maximum input voltage:	50 Ohm
Input resistance:	> 10 kOhm
Maximum resistance of wires supplying power to the sensor:	50 Ohm;
0/4-20mA inputs	
Input resistance:	20 Ohm +/-10%
Conversion characteristic:	Linear / Root-shaped ⁽⁴⁾ / User-defined
Transducers powered from recorder:	None (MPI-C) 24 VDC / 0.4 A common (MPI-CN – special version, MPI-CL)
Measurement error	
Measurement accuracy (at ambient temp. of 25 °C):	As specified in the table for the given sensor type
Temperature drift (between 0 and 50°C):	0,025% of the range/10 °C
Signal connections:	MPI-C, MPI-CL: 16 4-position pin type spring terminal blocks, max. cable diameter: 0.5 mm ² MPI-CN: spring terminal block, cable diameter: 0.2 mm ² – 1.5 mm ²



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BINARY INPUTS	
Number of inputs:	4
Maximum input voltage:	30 VDC or 30 V _{p-p}
Measurement range:	0.001 Hz - 10 kHz. (0.001 Hz - 1 kHz if the filtrating capacitor is connected)
Minimum pulse width:	20 μs (0.5 ms if the filtrating capacitor is connected)
Configuration: OC / contact	
Voltage (OC):	12 V
Current (contact):	12 mA
Switch on / off threshold:	2,7 V / 2,4 V
Configuration: input voltage	
Input resistance:	About 1 kΩ
Switch on / off threshold:	2,7 V / 2,4 V
Voltage (OC):	12 V
Namur configuration:	
High impedance:	0,4 mA – 1 mA,
Low impedance:	2,2 mA – 6,5 mA.
Signal connections:	
	MPI-C, MPI-CL: two 4-position pin type spring terminal blocks, max. cable diameter: 0.5 mm ² MPI-CN: spring terminal block, cable diameter: 0,2 mm ² – 1,5 mm ²
TWO-STATE OUTPUTS	
Number of outputs:	8
Type of outputs:	Solid-state relays
Maximum load current:	100 mA (AC/DC)
Maximum voltage:	60 V (AC/DC)
Wire connection:	MPI-C, MPI-CL: two 8-position pin type spring terminal blocks, max. cable diameter: 0.5 mm ² MPI-CN: spring terminal block, cable diameter: 0,2 mm ² – 1,5 mm ²
RS-485 SERIAL PORT	
Signals output on terminal block:	A(+), B(-), GND RS, +5 V RS (max 10mA), T(+), T(-)
Galvanic separation:	No
Maximum load:	32 receivers / transmitters
Transmission protocol:	ASCII Modbus RTU
Maximum length of line:	1200 m
Transmission rate:	1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbps
Parity control:	Even, Odd, None
Frame:	1 start bit, 8 data bits, 1 stop bit
Maximum differential voltage A(+) – B(-):	-8V ... +13V
Maximum total voltage A(+) – "ground" or B(-) – "ground":	-7V ... +12 V
Minimum output signal of transmitter:	1,5 V (at R ₀ = 54 Ohm)
Minimum sensitivity of receiver:	200 mV / R _{WE} = 12 kOhm
Minimum impedance of data transmission line:	27 Ohm
Short-circuit / thermal protection:	Yes
Internal terminating resistor:	Yes (activated by shorting the pins on the terminal block)
Wire connection:	MPI-C, MPI-CL: One 8-position pin type spring terminal blocks, max. cable diameter: 0.5 mm ² MPI-CN: spring terminal block, cable diameter: 0,2 mm ² – 1,5 mm ²
USB PORT	
Port socket:	A socket, as per USB standard
Version:	USB 1.1
Protection class:	IP54



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Recorded format:	Text file, FAT16 (within a limited scope)
Recording indication:	Green – red LED on the face plate.
ETHERNET PORT	
Transmission protocol:	Modbus TCP, ICMP (ping), DHCP server, http server
Interface:	10BaseT Ethernet
Data buffer:	300 B
Number of connections opened simultaneously:	4
Connection:	RJ-45
Indication LEDs:	2, in RJ45 socket
INTERNAL DATA MEMORY	
Capacity:	2 GB
Estimated recording time for recording speed every 3 s for 16 measuring channels:	ca. 400 days
Recording indication:	Green – red LED on the face plate.
SUPPLY (MPI-C)	
Supply voltage:	24 VAC (+5% / -10%) 20 ... 30 VDC (any polarity)
Power consumption:	4 W max
Wire connection:	one 6-position pin type spring terminal block, max. cable diameter: 0.5 mm ²
SUPPLY (MPI-CL, MPI-CN)	
Supply voltage:	230 VAC (+5% / -10%)
Power consumption:	typically 12 VA, 30 VA max
Wire connection:	MPI-CL: IEC 60320 C14 connector (power cord with plug C13 included) MPI-CN: spring terminal block, cable diameter: 0,2 mm ² – 1,5 mm ²
MECHANICAL DIMENSIONS – HOUSING (MPI-C)	
Type of housing:	For mounting in panels, non-flammable plastic "Noryl"
Dimensions (h x w x d):	72 mm X 144 mm X 130 mm
Dimensions of panel cut-out:	138 ⁺¹ mm X 68 ^{+0,7} mm
Maximum panel thickness:	5 mm
Weight:	ca. 1,1 kg
Protection class on front panel side:	IP54
Protection class on rear panel side:	IP30
MECHANICAL DIMENSIONS – HOUSING (MPI-CL)	
Type of housing:	Stand-alone, ABS plastic
Dimensions (h x w x d):	90 mm X 260 mm X 250 mm (without a handle) 90 mm X 300 mm X 305 mm (with a handle)
Weight:	ca. 2,1 kg
Protection class:	IP30
MECHANICAL DIMENSIONS – HOUSING (MPI-CN)	
Type of housing:	It can be suspended, ABS plastic
Dimensions (h x w x d):	216 mm X 260 mm X 125 mm (without cable glands) 246 mm X 260 mm X 125 mm (with cable glands)
Weight:	ca. 2,1 kg
Protection class:	IP54
CLIMATE CONDITIONS	
Ambient temperature	MPI-C: 0 .. +50 °C MPI-CN: 0 .. +50 °C MPI-CL: 0 .. +40 °C
Relative humidity	0 .. 75% (without steam condensation)
Storage temperature	-20 .. +80 °C
Overvoltage category	OVII
Pollution degree	PD2
LVD (safety)	EN 61010-1
EMC	EMC Directive 2014/30/UE EN 61326-1:2013 Tabela 2 (Immunity)



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	EN 55011:2009+A1:2010 Class A (Radiated and conducted emissions)
Installation location	Indoor use only



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INPUT TYPE	RANGE	PITCH	MEASUREMENT ACCURACY	CHARACTERISTIC
Pt100 *K (K=1..11)	-200 up to +850° C	0.1° C ⁽¹⁾	+/-0.5° C	IEC751
Ni100 *K (K=1..11)	-60 up to +250° C	0.1° C ⁽¹⁾	+/-0.5° C	DIN43760
J (Fe - CuNi)	-200 up to +1000°C	0.1° C ⁽¹⁾	+/-0.5° C	IEC584
K (NiCr - Ni)	-250 up to +1300°C	0.1° C ⁽¹⁾	+/-0.5° C	IEC584
T (Cu - CuNi)	-270 up to +400° C	0.1° C ⁽¹⁾	+/-0.5° C	IEC584
E (NiCr - CuNi)	-270 up to +1000°C	0.1° C ⁽¹⁾	+/-0.5° C	IEC584
N (NiCrSi - NiSi)	-50 up to +1300° C	0.1° C ⁽¹⁾	+/-2° C	IEC584
B (Pt30Rh -Pt6Rh)	300 up to +1800° C	0.1° C ⁽¹⁾	+/-2° C	IEC584
R (Pt13Rh - Pt)	0 up to +1750° C	0.1° C ⁽¹⁾	+/-2° C	IEC584
S (Pt10Rh - Pt)	0 up to +1750° C	0.1° C ⁽¹⁾	+/-2° C	IEC584
4-20 / 0-20mA	-9999 up to +9999	0.0001 up to 1	+/-0.1% scope	Linear / root-shaped ⁽²⁾ / user-defined

⁽¹⁾ – real measurement pitch, the pitch range can be set within the range of 0.0001 - 1.

⁽²⁾ – the resistance sensor can be set within a sub-range (200 - 600 Ohm), but it limits the signal processing performance.

⁽³⁾ – the voltage can be set within a sub-range (0 mV - 50 mV), but it limits the signal processing performance.

⁽⁴⁾ – root-shaped characteristics within the initial range is carried out according to the following algorithm: linear characteristics at inclination 1 for the initial value of 0 – 0.01, linear characteristics with inclination 10 within the range of 0.1 – 0.0247, root-shaped characteristics within the range of 0.0247 - 1.

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