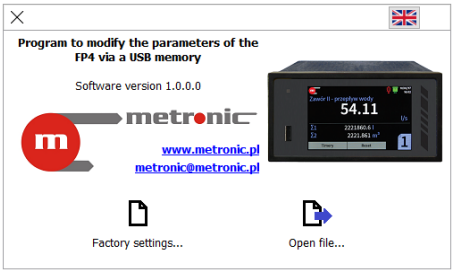
FP4

FLOW TOTALIZER WITH DATA RECORDING



- 2 analog inputs
- 2 PULS inputs
- 2 math channels
- 4-20mA analog output
- 4 solid state relays
- USB port on fornt panel
- Ethernet port and RS-485 port
- 4” Touch screen LCD
- Internal memory 2 GB

INTENDED USE:

- Measurement of flow and other quantities, e.g. temperature, humidity, pressure.
- Operation in dispersed measurement systems with local readings of measurement results.
- Grocery, steel, metallurgical, glass-making industry, warehouse and production line control.

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2 ANALOG INPUTS

Independent setup for input sensors:

- transducers with **4-20mA** (with optional power supply from device) or **0-20mA** current loop output,
- **RTD** sensors type Pt100 and Ni100 and their multiples (e.g. Pt200) as well as Cu50, Cu53, Cu100, KTY81, KTY83, KTY84;
- transducers with **0⋯2500 Ω** resistance output,
- transducers with **-1 V⋯+1 V** or **-10 V⋯+10 V** voltage output.

2 PULSE INPUTS

- frequency measurement in range **0,01 Hz ⋯ 10 kHz,**
- counting pulses,
- tracking and recording of **binary signal** (shorting or disconnecting).

2 MATH CHANNELS

- Available functions: addition, subtraction, multiplication, division.

ANALOG OUTPUT

- Retransmission of one of the channels as a 4-20mA current loop output signal.

TOTALIZERS:

- For each input there are available two totalizers L1 and L2.
- The totalizers can be reset manually or they can work automatically: daily , weekly or monthly.
- Totalizers T1 and T2 counting the operation time of totalisers.
- Frequency of archiving, for counters, from 1 min to 24h.

ALARM AND CONTROL SYSTEM:

- **4 solid state relays** 0,1 A / 60 V.
- **2 alarm and control thresholds** for each channel.

RECORDING MEASUREMENT RESULT:

- Recording data to internal 2GB memory, local access to recorded data through **USB port** on the front panel.
- Data recording rate between 2 s and 24 h; two recording frequencies toggled upon exceeding the set alarm thresholds.

COMMUNICATION WITH MASTER SYSTEM:

- RS-485 port, Modbus RTU protocol.
- Ethernet port, Modbus TCP protocol, web server.

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TECHNICAL DATA

Front panel	
Type of display:	LCD TFT 4” 800 px X 480 px LED lbacklight
Reading field size:	86.4mm X 52.5mm
Keyboard:	resistive touch panel
Indication:	LED RGB
Port USB (front panel)	
Version	USB 2.0 (with limited functionality, for connection of FLASH storage)
Port socket	USB standard ‘A’ type socket
Protection class	IP54 (with silicone dust cover)
Port Ethernet (rear panel)	
Interface	10/100Base-T Ethernet
Transmission protocol	Modbus TCP ICMP (ping)
Number of connections opened simultaneously:	Max 4
Connection	RJ-45
Port RS-485 (rear panel)	
Signals output on terminal block:	A(+), B(-)
Galvanic separation	None
Maximum load:	32 receivers / transmitters
Transmission protocol:	Modbus RTU
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
Galvanic separation:	250 VAC; 1500 VAC for 1 minute
Maximum length of line	1200 m
Internal terminating resistor	Vcc-A(+)-B(-)-G: 390Ω-220Ω-390Ω (activated by DIP-switches)
Maximum differntial voltage A(+), B(-)	±14 V
Minimum output signal of transmitter	1,5 V (at R_L= 54 Ω)
Minimum sensitivity of receiver	200 mV / R_{IN}= 12 kΩ
Minimum impedance of data transmission line	27 Ω
Short-circuit / thermal protection	Yes / Yes
Internal terminating resistor:	Yes , activation of terminator on rear panel, switch
Internal data memory	
Memory type	Flash
Capacity	2GB
Estimated recording time for recording speed every 10 s for 20 measuring channels	ca. 2 years
Supply	
Supply voltage	24 VDC (20 .. 30 VDC)
Maximum power consumption	6 W (typowo 4 W)
Security	The internal delay fuse 3,15 A, the exchange only by the service company
Electrical connecttions (terminal connectors)	
Type	screw terminal connectors
Wire cross section	wire 1,5 mm^2 max cord 1 mm^2 max

	cord with sleeve connectors 0,25 .. 1,5mm^2 AWG 30 / 14
Mechanical diamensions - housing	
Type of housing	For panel surface, nonflammable plastic material „Noryl”
Dimensions (h X w X d)	72mm X 144mm X127mm
Dimensions of panel cut-out	138^{+1}mm X $68^{+0,7}$mm
Maximum panel thickness	5mm
Weight	0,5 kg
Protection class	IP54 on front panel side IP20 on rear panel side
Environmental conditions	
Ambient temperature	0 .. +50° C
Relative humidity	5 .. 95% (without steam condensation)
Height	< 2000 m n.p.m.
Storage temperature	-30 .. +70° C
Degree of pollution	PD2
EMC	EMC Directive 2014/30/EC EN 61326-1:2013 Table 2 (immunity) EN 55011:2009+A1:2010 Class A (emission)
RoHS	RoHS Directive 2011/65/EU

Analog inputs	
Number of inputs	2 (input type (0 / 4-20mA / RTD / U) configurable by jumper inside the device)
Frequency of measurement	0,5 s / display every 1 s
Lowpass digital filter [(1)]:	A time constant programmed in the range from 2 to 60s
Galvanic separation between channels	None
Galvanic separation from the other circuits	Funcional, 250VAC
Maximum input voltage	±30 VDC between terminals A(I+), B(I-)
0/4-20mA inputs	
Measurement range:	0 ÷22 mA
Input resistance:	<100 Ω
Measurement accuracy (T_a = 25 °C)	±0,1% of range (typically ±0,05% of range)
Conversion characteristic:	Linear
Transducers powered from recorder:	24 VDC (+10/-20%), 24 mA (current-limited polymer fuse)
RTD / R inputs	
Sensor type:	• Resistive (refer the table below) • Linear resistance
Sensor connection type	2-wire
Sensor current	420µA
Wire resistance compensation in the 2-wire :	Constant within the range of -99 to+99 Ω
Resistance of wires (to the sensor):	max 50 ohm
Transducer resistance range:	0 do 2700 Ω
Measurement accuracy (Ta = 25 °C)	± 0,5 °C (typical ± 0,3 °C)
Conversion characteristic for R:	Linear
Range / RTD sensor temperature error	refer the table below
U (±10 V) input	
Transducer voltage range::	-10 V to +10V
Input resistance:	>10 k Ω

Conversion characteristic:	Linear
Measurement accuracy (Ta = 25 °C)	± 0,5% of range
PULS type inputs	
Number of inputs	2
Measurement range:	0,01Hz ÷ 10kHz, additional filter enabled 0,01Hz ÷ 1kHz, additional filter enabled
Minimum pulse width:	50 µs, additional filter enabled 0,5 ms, additional filter enabled
Maximum input voltage:	±30 VDC (between terminals F+ i F-)
Frequency measurement	
Charakterystyka przetwarzania:	Linear
Measurement accuracy (Ta = 20 °C)	0,05% * f ± 0,1 Hz
Pulse counting	
Conversion characteristic:::	Linear
Measuring range	0-10 kHz
Measurement accuracy (Ta = 20 °C)	0.05% * f ± 0.1 Hz (missing pulse counters)
Configuration: OC / contact	(default, filtrating condenser disconnected)
Open contact voltage:	about 4,3V
Short circuit current:	about 4,3 mA
Switch on / off threshold:	about 2,4 V / 2,6 V
Maximum short circuit resistance:	100 Ω
Configuration: NAMUR	
Input resistance:	1,5 kΩ
Switch on / off threshold:	about 1,6mA / 1,8mA
Configuration: current input EH	
Input resistance:	200Ω
Switch on / off threshold:	about 11 mA / 13 mA
Configuration: voltage input	
Input resistance:	>10kΩ
Switch on / off threshold:	about 2,4 V / 2,6 V
Maximum input voltage:	±30 VDC

Relay outputs	
Number of outputs:	4
Outputs type:	Solid state relays
Maximum voltage:	60 V AC/DC
Maximum load current:	0,1 A

Analog output 4-20mA	
Output signal:	4-20 mA
Maximum voltage between I+ and I-:	28 VDC
Minimum supply current loop voltage	9 VDC (R_L = 0 Ω)
Loop resistance (for U_{cc} = 24 V):	0 .. 500 Ω
Current loop supply:	External or from internal unit supply 24 V DC /22mA
Accuracy	0,1 (typically 0,05%)
Galvanic isolation to supply voltage:	Functional, 250 VAC

Table sensors RTD		
Sensor type	**Range**	**Accuracy**
Pt100, Pt200, Pt500 (PN-EN 60751:2009)	-200° .. +850° C -328° .. +1562° F	±0,5° C (typ. ±0,3° C) ±0,9° F (typ. ±0,5° F)
Pt1000 (PN-EN 60751:2009)	-200° .. +450° C -328° .. +842° F	±0,5° C (typ. ±0,3° C) ±0,9° F (typ. ±0,5° F)
Ni100, Ni120 (DIN43760 /08-1985)	-60° .. +250° C -76° .. +482° F	±0,5° C (typ. ±0,3° C) ±0,9° F (typ. ±0,5° F)
Ni1000 (DIN43760 /08-1985)	-60° .. +210° C -76° .. +410° F	±0,5° C (typ. ±0,3° C) ±0,9° F (typ. ±0,5° F)
Cu50, Cu53, Cu100 (GOST6651-2009)	-180° .. +200° C -292° .. +392° F	±0,5° C (typ. ±0,3° C) ±0,9° F (typ. ±0,5° F)
KTY81 (NXP Rev05-25.04.2008)	-55° .. +150° C -67° .. +302° F	±0,5° C ±0,9° F
KTY83 (NXP Rev06-4.04.2008)	-55° .. +175° C -67° .. +347° F	±0,5° C ±0,9° F

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