

# P10/P10A TRANSDUCER OF NETWORK PARAMETERS

## FEATURES:

**MOD BUS** LCD Display

**Lp Config** Password protection

**THD** RTC

Har I,U 25

## INPUTS:

**AC**

## OUTPUTS:

**RS 485**

P10

4x 4x 0...20 mA

P10A

4x 4x -5...5 mA

## GALVANIC ISOLATION:

**RS 485**

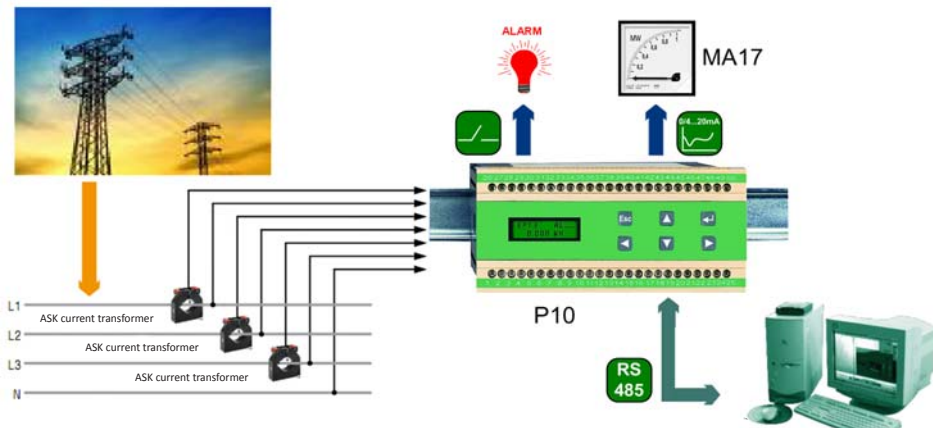
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- Measurement and conversion of power network parameters in 3 or 4-wire, balanced or unbalanced systems.
- Measurement of 15, 30 or 60 minutes' mean active power (synchronization by the internal clock or the walking window).
- Measurement of harmonic distortion coefficients (THD) and harmonics up to the 25 th for voltages and phase currents.
- Configurable analog (4) and alarm (4) outputs.
- 3 two-state inputs to control tariffs of watt-hour meters.
- Programmable parameters using push-buttons or through the RS-485 interface by means of the free LPConfig software.
- Digital RS-485 interface – MODBUS protocol.
- Indication of the real time and occurrence time of extremal values.
- Battery support of configuration data and transducer state at supply decay.

## EXAMPLE OF APPLICATION



## MEASURED PARAMETERS AND MEASURING RANGES

Measured value	Indication range	Intrinsic error	Remarks
Voltage U	100 V (Ku = 1) 400 V (Ku = 1) for Ku ≠ 1 ...400 kV	± (0.2% m.v + 0.1% of range)	Ru = 1... 4000
Current I	1.000 A (Ki = 1) 5.000 A (Ki = 1) for Ki ≠ 1: ...20.00 kA	± (0.2% m.v + 0.1% of range)	Ki = 1... 20000
Active power P Mean active power P <sub>AV</sub> Active energy EnP, EnP <sub>z</sub>	0.0...(-)1999.9 W (Wh) for Ku ≠ 1, Ki ≠ 1 (-)1999.9 MW (MWh)	± (0.5% m.v + 0.1% of range)	
Apparent power S Apparent energy EnS, EnS <sub>z</sub>	0.0...1999.9 VA (VAh) for Ku ≠ 1, Ki ≠ 1: 1999.9 MVA (MVAh)	± (0.5% m.v + 0.2% of range)	
Reactive power Q <sub>1</sub> Reactive energy Enb, Enb <sub>z</sub>	0.0...(-) 1999.9 var (varh) for Ku ≠ 1, Ki ≠ 1: (-)1999.9 Mvar (Mvarh)	± (0.5% m.v + 0.2% of range)	
Active power factor Pf	- 1.00... 0.00... 1.000	± 1% m.v ± 2c	Pf = P/S (power factor)
Coefficient tgφ (reactive power to active power ratio)	- 99.9...0... 99.9	± 1% m.v ± 2c (error in the range -60...0...+60°)	
Frequency f	20.0... 500.0 Hz	± 0.5% m.v	
THD U, THD I Harmonic U up to the 25 th Harmonic I up to the 25 th	0.2... 200%	± 5% m.v ± 2c	error in the range 10...120% U, I, 47..52 Hz

Where: Ku - ratio of voltage transformer, Ki - ratio of current transformer, m.v - measured value, c - the least significant display digit, z - counter from impulse input

## INPUTS

Input type	Properties
Two-state binary	• 3 two-state inputs 0/24 V d.c. ± 50% to control 4 tariffs of active, reactive and apparent energy counters

## OUTPUTS

Output type	Properties
Relay output	• 4 relays, voltageless NO contacts, load capacity 250 V a.c./0.5 A a.c.
Analog output	• P10: 4 programmable outputs 0...20 mA, 4...20 mA, 0.5 mA or 0...10 mA, accuracy 0.2 % • P10A: 4 programmable outputs - 5...0...+ 5 mA, or on request, -20 ...0...+20 mA, accuracy 0.2%

## DIGITAL INTERFACE

Type of interface	Transmission protocol	Mode	Baud rate
RS-485	MODBUS	RTU: 8N2, 8E1, 8O1; ASCII: 8N1, 7E1, 7O1	0,6, 1,2, 2,4, 4,8, 9,6, 19,2 kbit/s

## EXTERNAL FEATURES

Readout field	LCD display	2 x 16 characters
Overall dimensions	152 x 73.4 x 118.2 mm	fixing on a 35 mm DIN rail
Weight	0.5 kg	with packaging
Protection grade	for casing: IP40	from terminal side: IP20

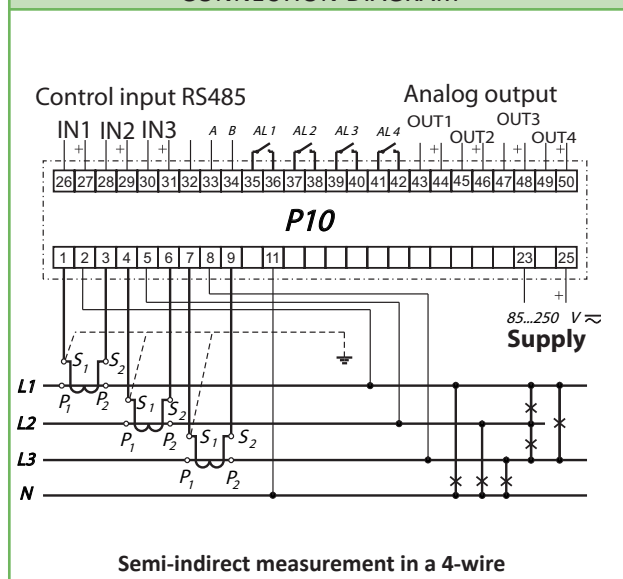
## RATED OPERATING CONDITIONS

Supply voltage	85...250 V a.c. (40...400 Hz) or d.c.	power input $\leq$ 10 VA
Power input	in voltage circuit $\leq$ 0.02 VA	in current circuit $\leq$ 0.1 VA
Input signal	<ul style="list-style-type: none"> <li>• 0...0.01...1.2 In; 0...0.01...1.2 Un for the measurement of current, voltage, power and energy in a 4-wire network;</li> <li>• 0...0.01...1.2 In; 0.1...1.2 Un for the measurement of current, voltage, power and energy in a 3-wire network;</li> <li>• 0...0.1...1.2 Un for frequency;</li> <li>• 0...0.05...1.2 In, 0...0.05...1.2 Un for Pf and tg <math>\phi</math> factors;</li> </ul>	When: • signal frequency 45...65 Hz • sinusoidal signal (THD $\leq$ 8%)
Power factor	-1...0...1	
Preheating time	5 min.	
Temperature	ambient 0...23...55°C	storage: - 20...85°C
Humidity	25...95%	inadmissible condensation
Operating position	any	
External magnetic field	0...40...400 A/m	
Short duration overload (5 s)	voltage input: 2Un (max. 1000 V)	current input: 10 IN
Admissible peak factor	current intensity: 2	voltage: 2
Add. error (in % of the intrinsic error)		from ambient temperature changes: <50%/10°C

## SAFETY AND COMPABILITY REQUIREMENTS

Electromagnetic compatibility	noise immunity	acc.to EN 61000-6-2
	noise emissions	acc.to EN 61000-6-4
Isolation between circuits	double	acc.to EN 61010-1
Polution level	2	
Installation category	III	
Maximum phase-to-earth voltage	600V	
Altitude a.s.l.	< 2000 m	

## CONNECTION DIAGRAM



Semi-indirect measurement in a 4-wire

## ORDERING

	P10 / P10 A -	X	X	X	X	XX	X
<b>Input current IN:</b>							
1 A (X/1)		1					
5 A (X/5)		2					
<b>Input phase voltage Un:</b>							
100 V			1				
400 V			2				
as per order*			X				
<b>Digital output:</b>							
without interface				0			
with RS-485 interface				1			
<b>Supply voltage:</b>							
85...250 V d.c. or a.c., 40...400 Hz					0		
as per order*					X		
<b>Version:</b>							
standard						00	
custom-made*						XX	
<b>Acceptance tests:</b>							
without additional quality requirements							8
with an extra quality inspection certificate							7
acc.to customer's request**							X
<b>Order example:</b>	The code: P10 - 2 1 1 0 00 7 means:						
	P10 - network parameter transducer of P10 type						
	2 - input range : 5 A						
	1 - input voltage : 100 V						
	1 - digital output with RS-485 interface						
	0 - supply voltage 85...250 V d.c./a.c.						
	00 - standard version						
	7 - with an extra quality inspection certificate						
	* after agreeing with the manufacturer						
	** the code number will be established after agreeing with the manufacturer						

SEE ALSO:



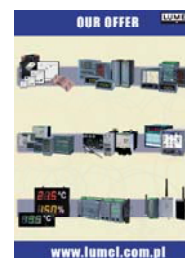
N10 - network parameters meter



Current transformers from 5 A up to 6 kA.



ND1 - Analyser of network parameters



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