N10 / N10A METER OF NETWORK PARAMETERS

LUMEL

FEATURES:

MOD BUS | Password protection | RTC | Lp Config | THD | Har I,U 25

INPUTS:

AC

OUTPUTS:

RS 485 (N10)

3x | 1x 0...20 mA (N10A)

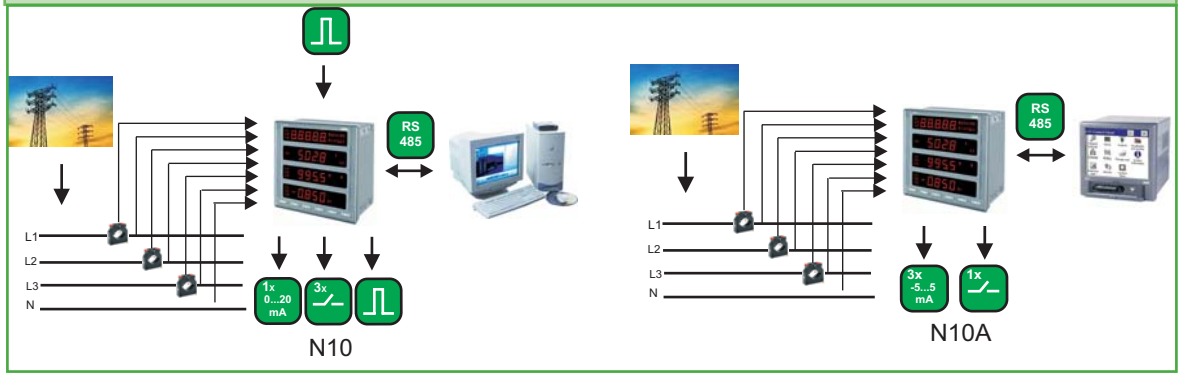
1x | 3x -5...5 mA

GALVANIC ISOLATION:

Supply | RS 485

- Measurement and conversion of power network parameters in 3 or 4-wire, balanced or unbalanced systems.
- Measurement and visualization of several scores of power network quantities and current and voltage harmonics (up to the 25 th).
- Indications taking into consideration programmed ratio values.
- Storage of minimal and maximal values.
- Backlit units of all quantities.
- Programmable number of pages and selection of displayed quantities on each of the 20 pages.
- Configurable analog outputs (N10-1, N10A-3) and alarm outputs (N10-3, N10A-1).
- Digital RS-485 output – MODBUS protocol.
- Impulse input to count the consumption of various medium (N10).
- Battery support of configuration data and counter state at supply decay.

EXAMPLE OF APPLICATION



MEASUREMENT AND VISUALIZATION OF POWER NETWORK PARAMETERS

- phase voltages U_1, U_2, U_3
- phase-to-phase voltages U_{12}, U_{23}, U_{31}
- phase currents I_1, I_2, I_3
- phase active powers P_1, P_2, P_3
- phase reactive powers Q_1, Q_2, Q_3
- phase apparent powers S_1, S_2, S_3
- phase active power factors Pf_1, Pf_2, Pf_3
- phase reactive /to active power factors $tg\varphi_1$, $tg\varphi_2$, $tg\varphi_3$
- 3-phase active, reactive and apparent powers P, Q, S
- mean 3-phase power factors Pf, tgφ
- frequency f
- mean 3-phase voltage U_s
- mean phase-to-phase voltage U_{mf}
- mean 3-phase current I_s
- mean active power e.g. 15 min. P_{AV}
- 3-phase active, reactive and apparent energy EnP, EnQ, EnS
- total harmonic distortion factors for phase voltages and phase currents THD_{U1}, THD_{U2}, THD_{U3}, THD_{I1}, THD_{I2}, THD_{I3}
- harmonics of phase voltages and currents –up to the 25 th

MEASURED PARAMETERS AND MEASURING RANGES

Measured value	Indication range	Intrinsic error	Remarks
Voltage U_i	100 V (Ku = 1) 400 V (Ku = 1) for Ku ≠ 1: ...400 kV	± (0.2% m.v + 0.1% of range)	Ku = 1... 4000
Current I_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_i Mean active power P_{AV} Active energy EnP, EnP_z	0.0...(-)1999.9 W (Wh) for Ku ≠ 1, Ki ≠ 1 (-)1999.9 MW (MWh)	± (0.5% m.v + 0.2% of range)	
Apparent power S_i Aparent energy EnS, EnS_z	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_i Reactive energy EnQ_z	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_i	- 1.00... 0.00... 1.000	± 1% m.v ± 2c	Pf = P/S (power factor)
Coefficient $tg\varphi_i$ (ratio of reactive power to active power)	- 99.9...0... 99.9	± 1% m.v ± 2c	error in the range - 9.99...0...9.99
Frequency f	15.0... 500.0 Hz	± 0.5% m.v	
THD U, THD I	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

INPUTS

Input type	Properties
Reactive impulse input	• 0/24V d.c. ±50% (N10 type)

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N10 / N10A METER OF NETWORK PARAMETERS

Outputs

Output type	Properties
Relay output	• 3 relays, voltageless NO contacts, load capacity 250 V a.c./0.5 A a.c. (N10 type) • 1 relay, voltageless NO contacts, load capacity 250 V a.c./0.5 A a.c. (N10A type)
Analog output	• 1 output: 0...20mA (4...20mA), programmable, accuracy 0.5% (N10 type) • 3 outputs: -5...5mA, programmable, accuracy 0.2% (N10A type)
Reactive impulse input	• 0...2 Hz, 12...50V d.c. (5...20mA) (N10 type)

Digital interface

Type of interface	Transmission protocol	Mode	Baud rate
RS-485	MODBUS RTU and ASCII	8N2, 8E1, 8O1, 8N1, 7E1, 7O2	0.3; 0.6;..., 19.2; kbit/s

External features

Readout field	4 x 5 LED digits	red or green color, 14 mm
Overall dimensions	144 x 144 x 77 mm	Panel cut-out : $138^{+0,5}$ x $138^{+0,5}$ mm
Weight	0.8 kg	
Protection grade	from frontal side: IP40	from terminal side: IP10

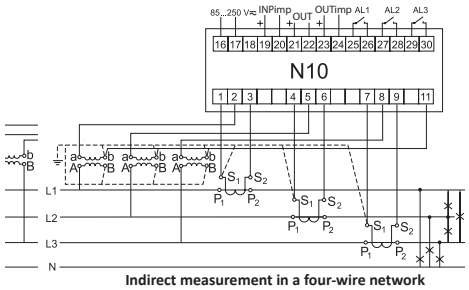
Rated operating conditions

Supply voltage	85...250 V a.c. (40...400 Hz) or d.c.	power input ≤ 12 VA
Power input	in voltage circut ≤ 0.5 VA	in current circut ≤ 0.1 VA
Input signal	•0...0.01...1.2 In; 0...0.01...1.2 Un for current, voltage, frequency, power and energy; •0.1...1.2 In; 0.1...1.2 Un; 47...52 Hz for THD U, THD I and harmonics	•0...0.02...1.2 In; 0...0.07...1.2 Un for power factors Pf, tgφ; •frequency 15...45...65...500 Hz •sinusoidal signal (THD ≤ 8%)
Power factor	-1...0...1	
Preheating time	5 min.	
Temperature	ambient 0...23...55°C	
Humidity	25...95%	inadmissible condensation
Operating positions	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
Additional error (in % of the intrinsic error)	from frequency of input signals: <50%	from ambient temperature changes: <50%/10°C

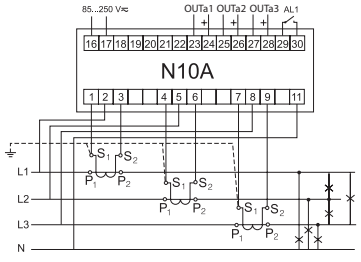
Safety and compability requirements

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

Connection diagram



Indirect measurement in a four-wire network



Semi-indirect measurement in a 4-wire network

Ordering

N10 / N10 A -	X	X	X	X	X	XX	X
Input current IN:							
1 A (X/1)	1						
5 A (X/5)	2						
Input phase voltage Un:							
100 V		1					
400 V		2					
Digital output:							
without interface			0				
with RS-485 interface			1				
Display:							
red				1			
green				2			
Suplly voltage:							
85..250 V d.c. or a.c., 40..400 Hz					0		
Version:							
standard						00	
custom-made*						XX	
Acceptance tests:							
without additional quality requirements							8
with an extra quality inspection certificate							7
acc.to customer's request*							X

Order example:
The code: **N10 - 2 1 1 2 0 0 0 7** means:

N10 - network parameter of N10 type
2 - input range : 5 A
1 - input voltage : 100 V
1 - digital output with RS-485 interface
2 - green display
0 - supply voltage 85...250 V d.c./a.c., 40...400Hz
00 -standard version
7 - with an extra quality inspection certificate
* after agreeing with the manufacturer

See Also:

LPConfig

Free LPConfig software

Current transformers from 5 A up to 6 kA.

PD10 - Interface converter

ND1 - Analyser of network parameters

For more information about LUMEL's products please visit our website: www.lumel.com.pl

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