



N10 / N10A METER OF NETWORK PARAMETERS

FEATURES:

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

INPUTS:

- AC
- Impulse

OUTPUTS:

- RS 485** N10
- 3x 0...20 mA N10A
- 1x -5...5 mA

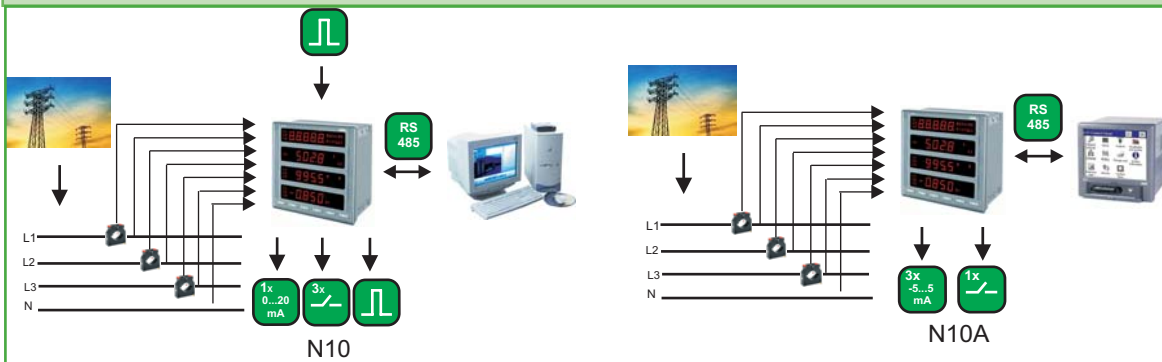
GALVANIC ISOLATION:

- 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 $tg\phi_1, tg\phi_2, tg\phi_3$
- 3-phase active, reactive and apparent powers P, Q, S
- mean 3-phase power factors $Pf, tg\phi$
- 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_2 | 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 Apparent energy EnS, EnS_2 | 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_2 | 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 $tg\phi_i$ (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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SEE ALSO:



Free LPConfig software



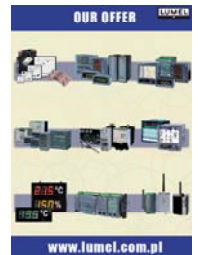
Current transformers from 5 A up to 6 kA.



PD10 - Interface converter



ND1 - Analyser of network parameters



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

OUTPUTS

| Output type | Properties |
|------------------------|--|
| Relay output | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 |

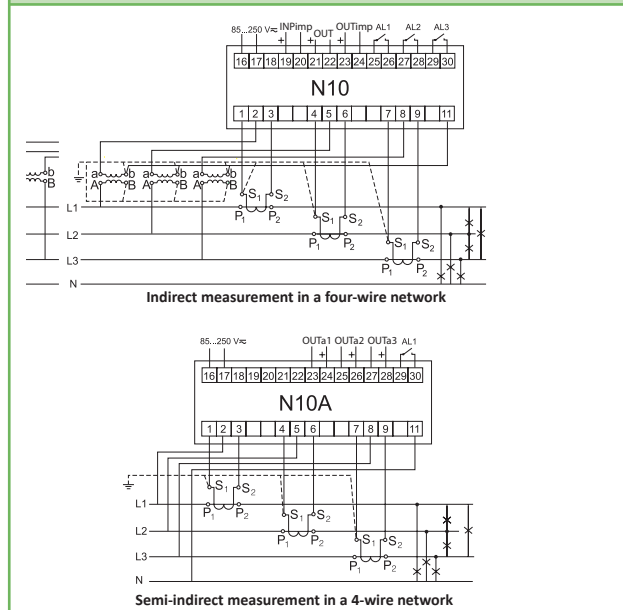
RATED OPERATING CONDITIONS

| | | |
|--|--|--|
| Supply voltage | 85...250 V a.c. (40...400 Hz) or d.c. | power input ≤ 12 VA |
| Power input | in voltage circuit ≤ 0.5 VA | in current circuit ≤ 0.1 VA |
| Input signal | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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



ORDERING

| | N10 / N10 A - | 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 | | |
| Supply 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 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