

NEW!

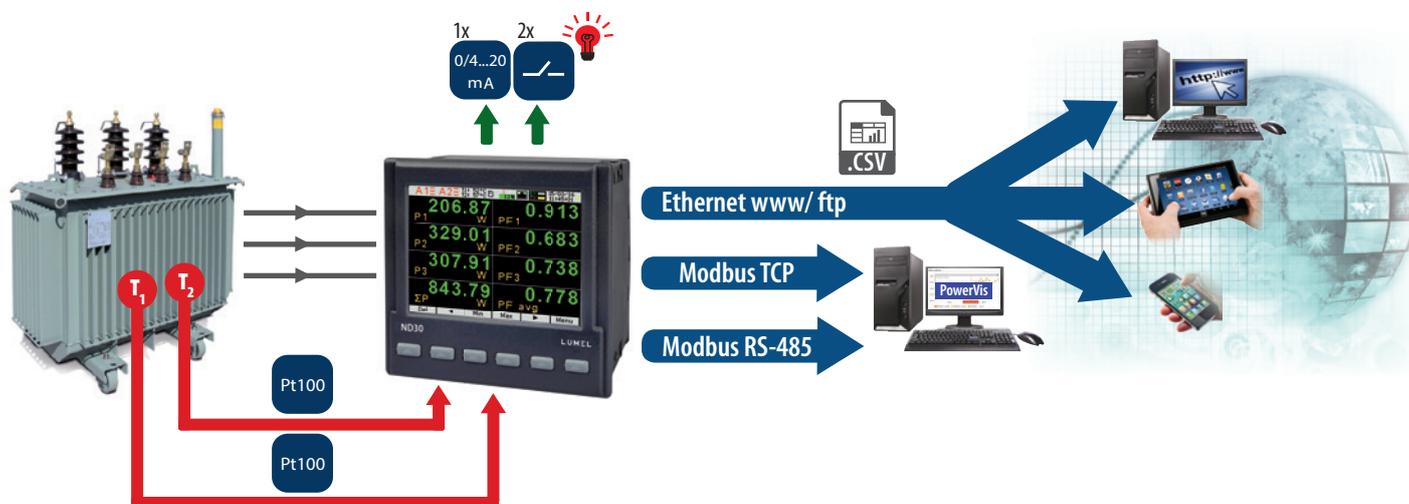


ND30

- METER OF POWER NETWORK PARAMETERS

- **Measurement and recording** of 54 power network parameters, including **current and voltage harmonics up to 51st**, in 1-phase 2-wire or 3-phase 3 or 4-wire balanced and unbalanced systems.
- **Graphical color display:** LCD TFT 3,5", 320 x 240 pixels, **fully configurable by a user** (10 vies, 8 parameters in each)
- Indications include the values of programmed ratios.
- Memory of minimum and maximum values.
- 2 configurable alarm outputs.
- Optional: analog output 0/4...20 mA and 2 PT 100 inputs (eg. for measurement of transformer temperature).
- Data archiving in the internal memory 8 GB (option).
- Digital output RS-485 - MODBUS protocol.
- **Modern and user-friendly Ethernet interface** 10/100 BASE-T (option):
 - protocol: MODBUS TCP/iP, HTTP, FTP,
 - services: www server, ftp server, DHCP client.
- Programming of parameters using **free eCon software**.
- Battery backup RTC.
- Overall dimensions: 96 x 96 x 77 mm.

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
- active phase powers: P_1, P_2, P_3
- reactive phase powers: Q_1, Q_2, Q_3
- apparent phase powers: S_1, S_2, S_3
- active power factors: PF_1, PF_2, PF_3
- reactive/active power factors: $tg\phi_1, tg\phi_2, tg\phi_3$
- active, reactive and apparent 3-phase power: P, Q, S
- mean 3-phase power factors: $PF, tg\phi$
- frequency f
- mean 3-phase voltage: U_3
- mean phase-to-phase voltage: U_{mf}
- mean 3-phase current: I_3
- 15, 30, 60 minutes' mean active power: P_{demand}
- mean apparent power S_{demand}
- average current I_{demand}
- active, reactive and apparent 3-phase energy: EnP, EnQ, EnS
- active, reactive and apparent energy from external counter: $EnPE$
- total harmonic content coefficients for phase voltages and currents $THD_{U1}, THD_{U2}, THD_{U3}, THD_{I1}, THD_{I2}, THD_{I3}$ and for 3-phase voltages and currents THD_U, THD_I
- harmonics for current and phase voltage up to 51 st!
- temperature (2 x Pt100 input)

| FEATURES | INPUTS | OUTPUTS | GALVANIC ISOLATION |
|----------|--------|---------|--------------------|
| | | | |

TECHNICAL DATA

MEASURING RANGE

| Measured value | Measuring range | L1 | L2 | L3 | Σ | Class (*) / Basic error (*) class relative to the measured value acc. to EN61557-12 |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----|----|----|----------|----------------------------------------------------------------------------------------------|
| Current I/5 A 1 A~ 5 A~ | 0.010 ..0.100..1.200 A (tr_I=1) 0.050 ..0.500.. 6.000 A (tr_I=1) ...20.00 kA (tr_I≠1) | • | • | • | | Class 0.2 |
| Voltage L-N 57.7 V~ 230 V~ 400 V~ | 5.7..11.5 ..70.0 V (tr_U=1) 23.0..46 .. 276.0 V (tr_U=1) 40.0..80 .. 480.0 V (tr_U=1) ...480.0 kV (tr_U≠1) | • | • | • | | Class 0.2 |
| Voltage L-L 100 V~ 400 V~ 690 V~ | 10.0 ..20.. 120.0 V (tr_U=1) 40.0..80 .. 480.0 V (tr_U=1) 69.0..138 .. 830.0 V (tr_U=1) ...830.0 kV (tr_U≠1) | • | • | • | | Class 0.5 |
| Active power P _v , average active power P _{dt} | .. (-)1999.9 W ..(-)1999.9 MW (tr_U≠1.tr_I≠1) | • | • | • | • | Class 0.5 |
| Reactive power Q _i | .. (-)1999.9 Var ..(-)1999.9 MVar (tr_U≠1.tr_I≠1) | • | • | • | • | Class 1 |
| Apparent power S _v , average apparent power S _{dt} | ..1999.9 VA ..1999.9 MVA (tr_U≠1.tr_I≠1) | • | • | • | • | Class 0.5 |
| Active energy EnP (imported or exported) | .. (-)1999.9 Wh ..(-)1999.9 MWh (tr_U≠1.tr_I≠1) | | | | • | Class 0.5 |
| Reactive energy EnQ (inductive or capacitive) | .. (-)1999.9 Varh ..(-)1999.9 MVarh (tr_U≠1.tr_I≠1) | | | | • | Class 1 |
| Apparent energy EnS | .. 1999.9 VAh ..1999.9 MVAh (tr_U≠1.tr_I≠1) | | | | • | Class 0.5 |
| Active power factor PF _i | -1.00 ..0 ..1.00 | • | • | • | • | ± 0.01 of basic error |
| Coefficient tgφ _i (ratio of reactive power to active power) | -1.20 ..0 ..1.20 | • | • | • | • | ± 0.01 of basic error |
| Frequency f | 45.00..65.00 Hz | | | | • | Class 0.1 |
| Total harmonic distortion of voltage THDU and current THDI | 0.0 ..100.0 % | • | • | • | • | Class 5 50 / 60 Hz |
| Amplitudes of the voltage U _{h1} ...U _{h50} , and current I _{h1} ... I _{h50} | 0.0 ..100.0 % | • | • | • | | Class 5 50 / 60 Hz |

tr_I, tr_U – ratio of current and voltage transformer

INPUTS

| Input type | Properties |
|-------------------------------|---------------------------------------------------|
| Input Pt100 (T1, T2) - option | 2 x Pt100, 2-wire, -50...400°C, basic error 0.5 % |

DIGITAL INTERFACE

| Interface type | Transmission protocol | Remarks |
|--------------------------------|----------------------------------------------|----------------------------------------------------|
| RS-485 | Modbus RTU 8N2,8E1,8O1,8N1 Address 1..247 | baud rate: 4.8, 9.6, 19.2 38.4, 57.6, 115.2 kbit/s |
| Ethernet 10/100 Base-T -option | Modbus TCP,HTTP,FTP | WWW server, FTP server, DHCP client |

EXTERNAL FEATURES

| | | |
|--------------------|------------------------------------------------------|------------------------------|
| Readout field | graphic color display LCD TFT 3,5", 320 x 240 pixels | |
| Overall dimensions | 96 x 96 x 77 mm | mounting hole 92.5 x 92.5 mm |
| Weight | 0.3 kg | |
| Protection grade | from frontal side: IP65 | from terminal side: IP20 |

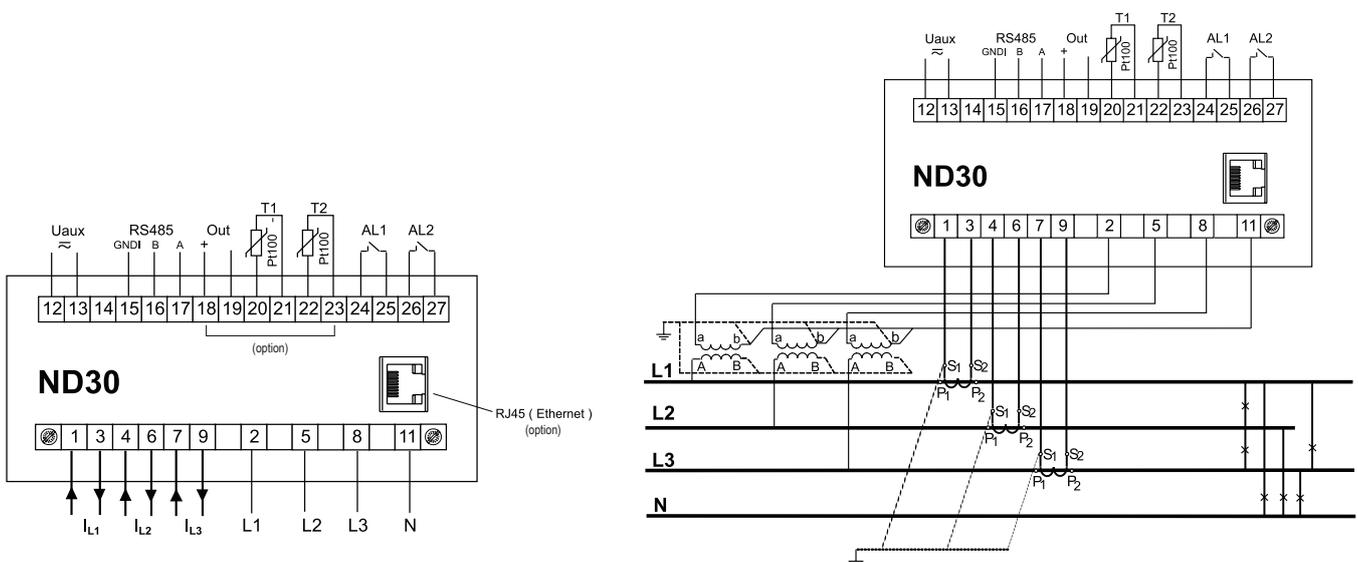
RATED OPERATING CONDITIONS

| | | |
|------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------|
| Supply voltage | 85...253 V a.c. (40...400 Hz) or 90...300 V d.c. | power consumption ≤ 6 VA |
| Power consumption | in voltage circuit ≤ 0.2 VA | in current circuit ≤ 0.1 VA |
| Input signal | 0...0.1...1.2 In; 0.1...0.2...1.2 Un for current, voltage, PF, tg ϕ | frequency 45...50...60...65 Hz, sinusoidal (THD $\leq 8\%$) |
| Power factor | -1...0...1 | |
| Preheating time | 5 min. | |
| Ambient temperature | -10...23...55°C, class K55 acc. to EN61557-12 | |
| Humidity | 0...40...65...95% | without condensation |
| Operating position | any | |
| External magnetic field | $\leq 40...400$ A/m d.c. | ≤ 3 A/m a.c. 50/60 Hz |
| Short-term overload | voltage input: 2 Un (5 sec.) | current input 50 A (1 sec.) |
| Admissible crest factor | current: 2 | voltage: 2 |
| Additional error (in % of the intrinsic error) | | from ambient temperature change: $< 50\% / 10^\circ\text{C}$ |

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 | acc. to EN 61010-1 |
| Pollution level | 2 | acc. to EN 61010-1 |
| Installation category | III | acc. to EN 61010-1 |
| Maximal phase-to-earth voltage | <ul style="list-style-type: none"> for supply circuit and relay outputs 300 V for measuring input 500 V for circuits of RS-485, Ethernet, pulse input and output, analog outputs: 50 V | acc. to EN 61010-1 |
| Altitude a.s.l. | < 2000 m | |

CONNECTION DIAGRAMS



Description of meter connections strips

Indirect measurement in 4-wire network - connection of input signals

DISPLAING OF MEASUREMENT PARAMETERS



up to 10 programmable screens
(8 parameters per page);
ability to change color for all screens



Available colors for digital indications:



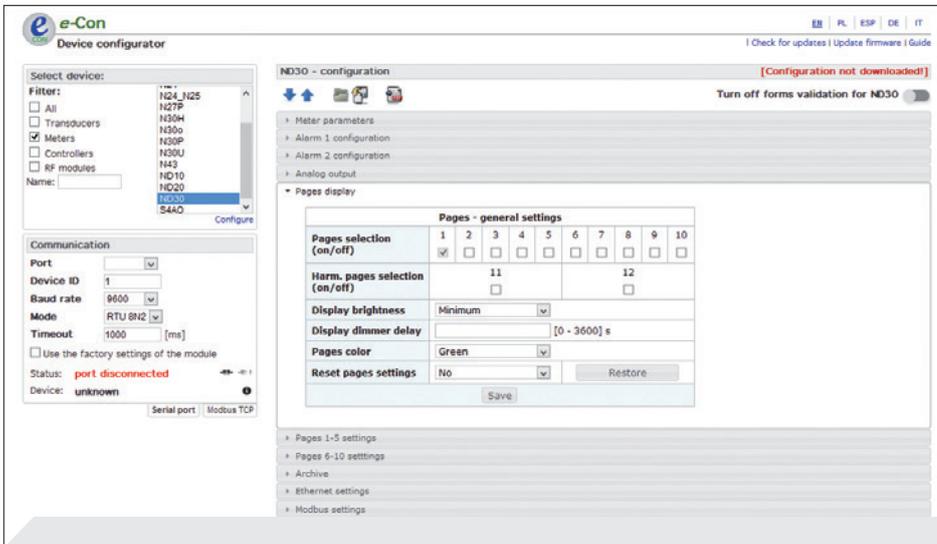
two screens dedicated to harmonics;
indication of individual harmonic
for voltages and currents (up to 51st);
bargraph presentation for all harmonics
with zoom function



easy to use and intuitive menu;
information bar with status of: phase
sequence, alarm outputs, temperature
measurements*, archiving and memory*,
Ethernet* and RS-485 interfaces,
time and date

*- availability of feature depends on
hardware version of ND30

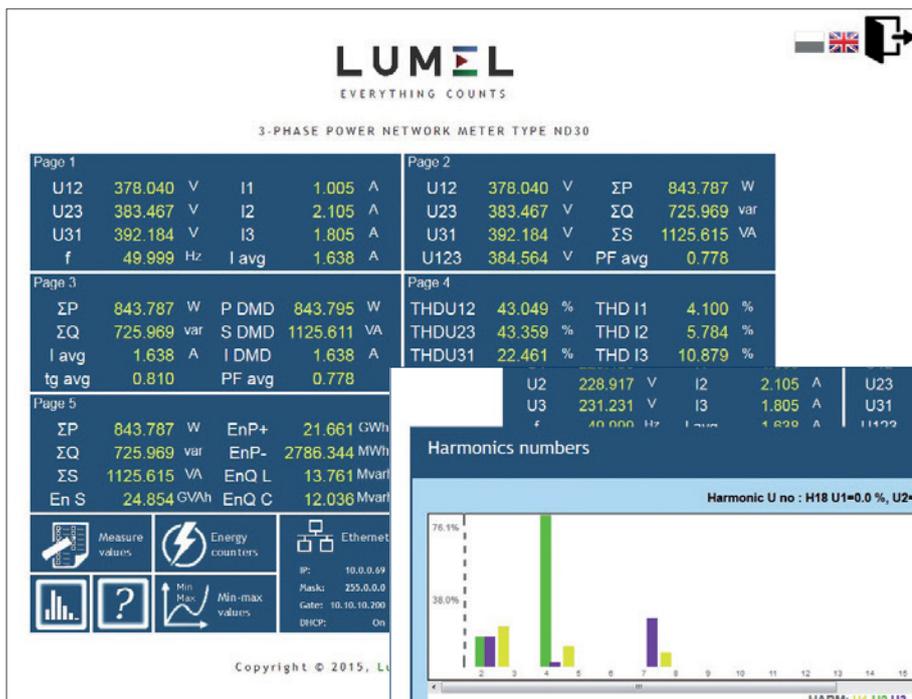
METER CONFIGURATION WITH FREE eCON SOFTWARE



ability to configure and update ND30 with free eCon software (via RS-485 or Ethernet* interface)

*- availability of feature depends on hardware version of ND30

REMOTE READOUT OF PARAMETERS THROUGH ETHERNET: WWW SERVER, FTP



WEB server* for remote reading of current measurement data; FTP server* for downloading archived CSV files

*- availability of feature depends on hardware version of ND30



ORDERING CODE

| Meter ND30 - | X | X | X | XX | X | X |
|-------------------------------------------------|---|---|---|----|---|---|
| Input voltage (phase/phase-to-phase) Un: | | | | | | |
| 3 x 57.7/ 100 V, 3x 230/ 400 V | 1 | | | | | |
| 3 x 110/ 190 V, 3 x 400/ 690 V | 2 | | | | | |
| Additional outputs /inputs: | | | | | | |
| 2 relays | 1 | | | | | |
| 2 relays, 1 analog output, 2 inputs PT100 | 2 | | | | | |
| Interface: | | | | | | |
| RS-485 | | 1 | | | | |
| RS-485 and Ethernet, internal memory | | | 2 | | | |
| Version: | | | | | | |
| standard | | | | 00 | | |
| custom-made* | | | | XX | | |
| Language: | | | | | | |
| Polish | | | | | P | |
| English | | | | | E | |
| other* | | | | | X | |
| Acceptance tests: | | | | | | |
| without additional quality requirements | | | | | | 0 |
| with an extra quality inspection certificate | | | | | | 1 |
| acc.to customer's request* | | | | | | X |

Order example:

The code: **ND30 - 1 2 2 00 E 0** means:

ND30 - meter ND30

1 - input voltage 3 x 57.7/ 100 V, 3x 230/ 400 V

2 - 2 relays, 1 analog output, 2 inputs PT100

2 - RS-485 and Ethernet, internal memory

00 - standard version

E - user's manual in English

0 - without additional quality requirements.

* only after agreeing with the manufacturer

SEE ALSO:



ND40 - power network analyzer/ recorder



RE92 - dual loop controller



P30U - universal transducer of temperature and standard signals



KS31 - Digital synchronizing unit



N43 - rail mounted 3-phase power network meter



P43 - 3-phase transducer of power network parameters



ND1 - analyser of network parameters



Current transformers from 5 A up to 6 kA



Free **eCON** software

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ND30-19_en