Z-TRAUQ INC.
www.z-trauq.com 877-798-7287 sales@z-trauq.com

ND30 - METER OF POWER NETWORK PARAMETERS
ND30IoT - METER OF POWER NETWORK PARAMETERS FOR IoT APPLICATIONS

- **Measurement** of 54 power network parameters, including **current and voltage harmonics up to 63rd** in 1-phase 2-wire or 3-phase 3 or 4-wire balanced and unbalanced systems.
- **The MQTT protocol is ideal for communication in distributed acquisition systems data - IoT applications (ND30IoT).**
- **High accuracy class (0.2S for active energy).**
- **Graphical color display:** LCD TFT 3,5'', 320 x 240 pixels, **fully configurable by a user** (10 views, 8 parameters in each).
- **Additional 2 pages for harmonics presentation and 1 dedicated page for visualization in the form of an analog meter.**
- 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), 2 galvanically isolated binary inputs 0/5...24V d.c.
- Archiving of up to 32 measured parameters 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,
  - protocol: MQTT (ND30IoT),
  - 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.
- **Supervisory relay mode for alarm outputs (ND30 and ND30IoT)**
- **MQTT protocol (for ND30)**

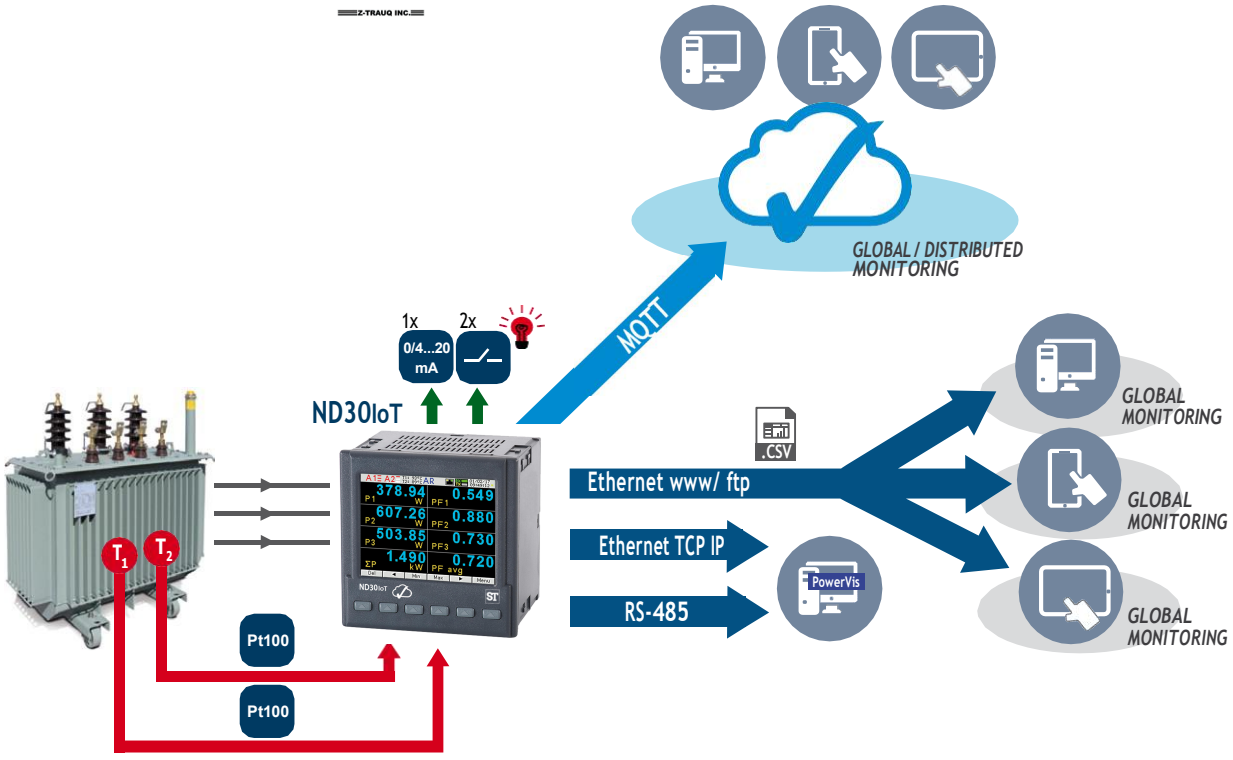
Electrical Safety CAT III CE

NEW FUNCTIONS

Remarks:

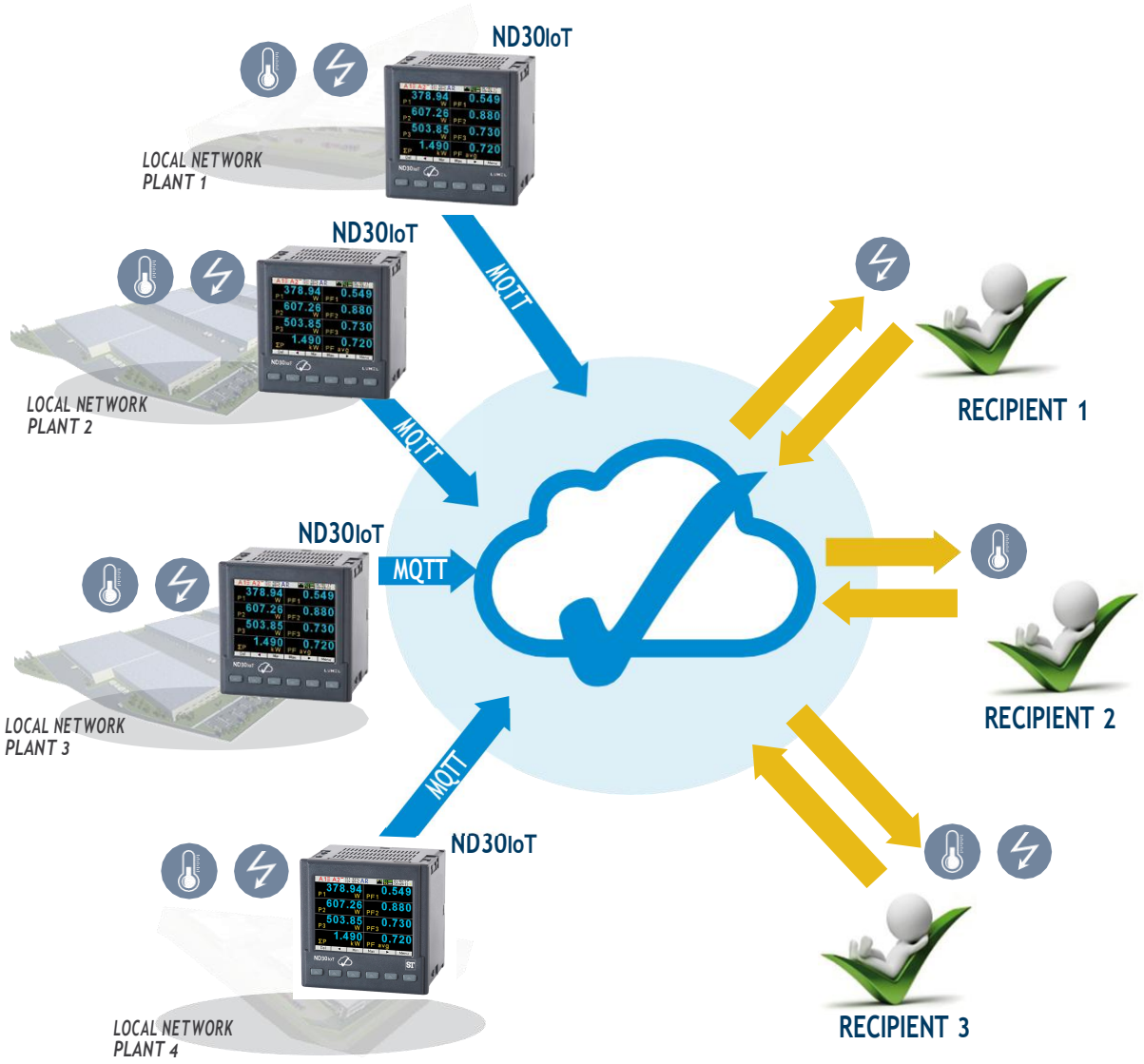
- New features available from 1.07 firmware version.
- To make functions active, order appropriate licence key - details in ordering code.
- Functions can be also activated on the devices which have been alredy installed on the facility after software upgrade.

EXAMPLE OF APPLICATION



ND30, ND30IoT - METER OF POWER NETWORK PARAMETERS

EXAMPLE OF APPLICATION

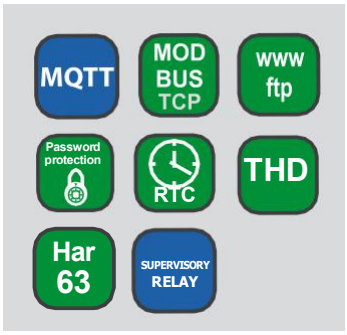


MEASUREMENT AND VISUALIZATION OF POWER NETWORK PARAMETERS

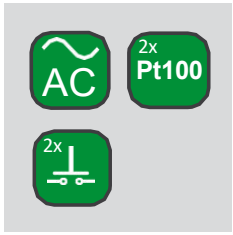
- phase voltages: U_1, U_2, U_3
- phase-to-phase voltages: U_{12}, U_{23}, U_{31}
- phase currents I_1, I_2, I_3
- active phase powers: P_1, P_2, P_3
- reactive phase powers: Q_1, Q_2, Q_3
- apparent phase powers: S_1, S_2, S_3
- active power factors: PF_1, PF_2, PF_3
- reactive/active power factors: tg_1, tg_2, tg_3
- active, reactive and apparent 3-phase power: P, Q, S
- mean 3-phase power factors: PF, tg frequency
- f
- mean 3-phase voltage: U_s
- mean phase-to-phase voltage: U_{mf}
- mean 3-phase current: I_s
- 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 63rd!
- temperature (2 x Pt100 input)

ND30, ND30IoT - METER OF POWER NETWORK PARAMETER

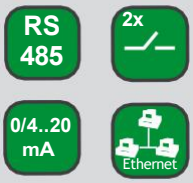
FEATURES



INPUTS



OUTPUTS



GALVANIC ISOLATION

TECHNICAL DATA

MEASURING RANGE

Measured value	Measuring range	L1	L2	L3	Σ	Class
Current 1/5 A 1 A~ 5 A~	0.002 ..0.100..1.200 A 0.010 ..0.500.. 6.000 A ...100.00 kA (tr_I≠1)	•	•	•		0.2 (EN 61557-12)
Voltage L-N 57.7 V~ 110 V~ 230 V~ 400 V~	5.700..11.500 ..70.000 V 11.000..22.000 ..132.00 V 23.000..46.000 .. 276.00 V 40.000..80.000 .. 480.00 V ...1920.0 kV	•	•	•		0.2 (EN 61557-12)
Voltage L-L 100 V~ 190 V~ 400 V~ 690 V~	10.000 ..20.000..120.00 V 19.000 ..38.000..228.00 V 40.000..80.00 .. 480.00 V 69.000..138.00 .. 830.00 V ...1999.0 kV (tr_U≠1)	•	•	•		0.5 (EN 61557-12)
Active power P	-19999 MW .. 0,000 W .. ..19999 MW (tr_U≠1,tr_I≠1)	•	•	•	•	0.5 (EN 61557-12)
Reactive power Q	-19999 MVar .. 0,000 Var .. ..19999 MVar (tr_U≠1,tr_I≠1)	•	•	•	•	1 (EN 61557-12)
Apparent power S	0.000 .. 1999,9 VA .. ..19999 MVA (tr_U≠1,tr_I≠1)	•	•	•	•	0.5 (EN 61557-12)
Active energy EnP (imported or exported)	0.000 .. 99 999 999.999 kWh				•	**0.2S (EN 62053-22)**
Reactive energy EnQ (inductive or capacitive)	0.000 .. 99 999 999.999 kVarh				•	1 (EN 61557-12)
Apparent energy EnS	0.000 .. 99 999 999.999 kVAh				•	0.5 (EN 61557-12)
Active power factor PF	-1.00 ..0 ..1.00	•	•	•	•	1 (EN 61557-12)
Coefficient tg (ratio of reactive power to active power)	-999.99...-1.20 .. 0 .. 1.20..999.99	•	•	•	•	1
Frequency f	45.00...65.000 100.00 Hz				•	0.1 (EN 61557-12)
Total harmonic distortion of voltage THDU and current THDI	0.0 ..100.0 %	•	•	•	•	5 (EN 61557-12)
Amplitudes of the voltage U_{h2}...U_{h63}, and current I_{h2} ... I_{h63}	0.0 ..100.0 %	•	•	•		II (IEC61000-4-7)

tr_I - Current transformer ratio = Transformer primary current / Current transformer secondary current
tr_U - Voltage transformer ratio = Transformer primary voltage / Voltage transformer secondary voltage

ADDITIONAL INPUTS

Input type	Properties
Input Pt100 (T1, T2) - option	2 x Pt100, 2-wire, -50...400°C, basic error 0.5 %
Binary inputs - option	0 V d.c. - binary input inactive, 5...24 V d.c. - binary input active

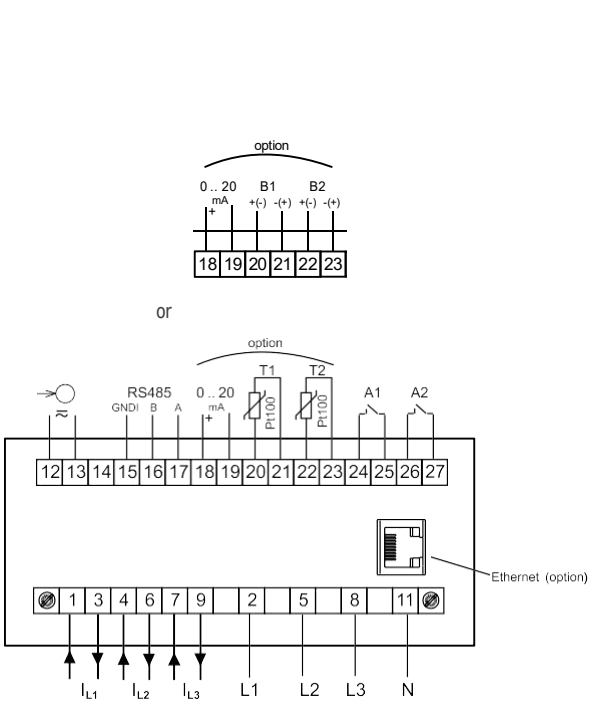
DIGITAL INTERFACE

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
	MQTT		

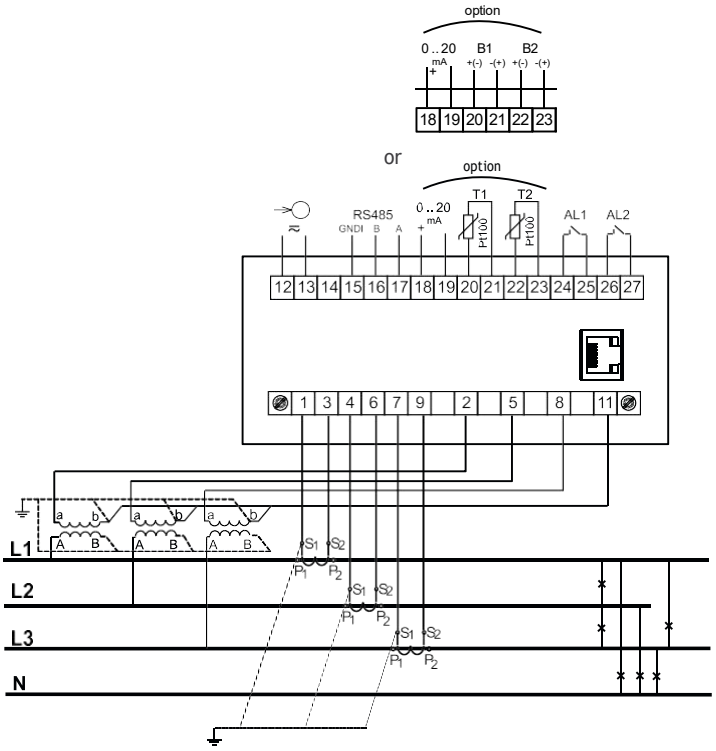
ND30, ND30IoT - METER OF POWER NETWORK PARAMETERS

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...50...400 Hz) , 90...300 V d.c. or 20...40 V a.c., 20...60 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.....Un for current, voltage, PF_i, tg_i	frequency 45...50...60...100 Hz, sinusoidal (THD ≤ 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	≤ 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°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
Polution level	2	acc. to EN 61010-1
Installation category	III	acc. to EN 61010-1
Maximal phase-to-earth voltage	• 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



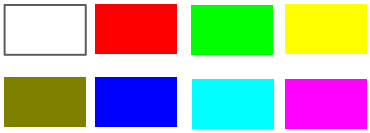
Indirect measurement in 4-wire network - connection of input signals

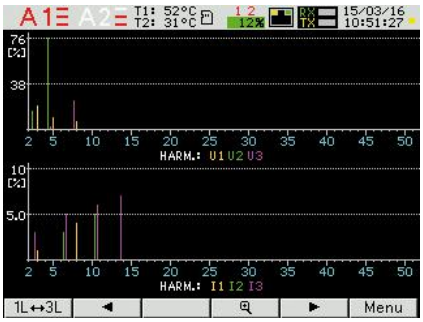
ND30, ND30IoT - METER OF POWER NETWORK PARAMETER

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

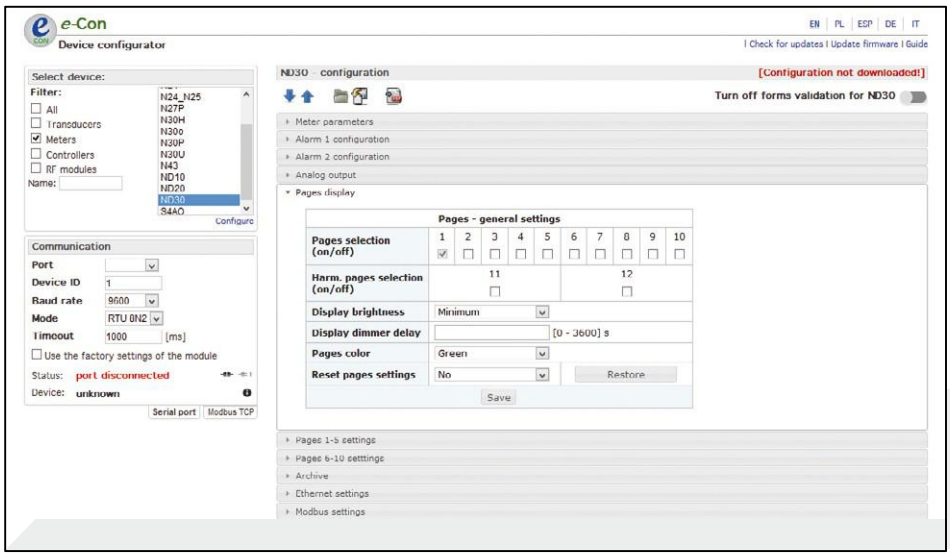
presentation in the form of analog meter view with min/max preview for display value and zoom function

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 ND30IOT, ND30

ND30, ND30IoT - METER OF POWER NETWORK PARAMETERS

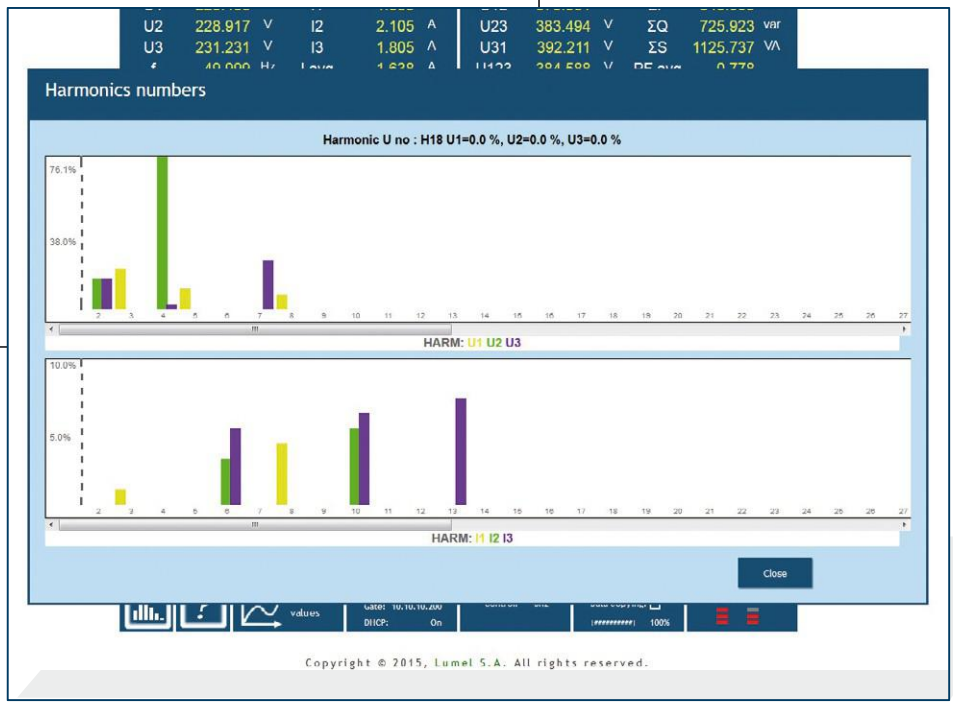
METER CONFIGURATION WITH FREE eCON SOFTWARE



ability to configure and update ND30IOT, ND30 with free eCon software (via RS-485 or Ethernet* interface)

*- availability of feature depends on hardware version of ND30IOT, ND30

REMOTE READOUT OF PARAMETERS THROUG 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 ND30IOT, ND30

ORDERING CODE

Code	Description
ND30IoT 1121MSMO*	Power network meter (MQTT) ND30IoT type Input current 1A/5A, X/1A, X/5A Input voltage 3x57.7/100V, 3x230/400V 2x relays, Ethernet and RS-485 interface, internal memory 8GB, supply 85-253V a.c. or 90-300V d.c., MQTT protocol, Supervisory relay, documentation and descriptions in Polish and English version, test certificate
ND30IoT 2222MSMO*	Power network meter (MQTT) ND30IoT type Input current 1A/5A, X/1A, X/5A, Input voltage 3x110/190V, 3x400/690V 2x relays, 1x analog output 0-20mA, 2x Pt100 input, Ethernet and RS-485 interface, internal memory 8GB, supply 20-40V a.c. or 20-60V d.c., MQTT protocol, Supervisory relay, documentation and descriptions in Polish and English version, test certificate
ND30IoT 1221MSMO*	Power network meter (MQTT) ND30IoT type Input current 1A/5A, X/1A, X/5A, Input voltage 3x57.7/100V, 3x230/400V 2x relays, 1x analog output 0-20mA, 2x Pt100 input, Ethernet and RS-485 interface, internal memory 8GB, supply 85-253V a.c. or 90-300V d.c., MQTT protocol, Supervisory relay, documentation and descriptions in Polish and English version, test certificate
ND30IoT 2221MSMO*	Power network meter (MQTT) ND30IoT type Input current 1A/5A, X/1A, X/5A, Input voltage 3x110/190V, 3x400/690V 2x relays, 1x analog output 0-20mA, 2x Pt100 input, Ethernet and RS-485 interface, internal memory 8GB, supply 85-253V a.c. or 90-300V d.c., MQTT protocol, Supervisory relay, documentation and descriptions in Polish and English version, test certificate
ND30IoT 1122MSMO*	Power network meter (MQTT) ND30IoT type Input current 1A/5A, X/1A, X/5A, Input voltage 3x57.7/100V, 3x230/400V 2x relays, Ethernet and RS-485 interface, internal memory 8GB, supply 20-40V a.c. or 20-60V d.c., MQTT protocol, Supervisory relay, documentation and descriptions in Polish and English version, test certificate
ND30IoT 2121MSMO*	Power network meter (MQTT) ND30IoT type Input current 1A/5A, X/1A, X/5A, Input voltage 3x110/190V, 3x400/690V 2x relays, Ethernet and RS-485 interface, internal memory 8GB, supply 85-253V a.c. or 90-300V d.c., MQTT protocol, Supervisory relay, documentation and descriptions in Polish and English version, test certificate

* Upon agreement, an option to order a calibration certificate for the product is available against payment. Then, in the execution code, in the place of the last character, enter the digit 2, e.g. **ND30IoT 2121MSM2**. The customer will then receive a standard test certificate and a calibration certificate (against payment).

ND30, ND30IoT - METER OF POWER NETWORK PARAMETERS

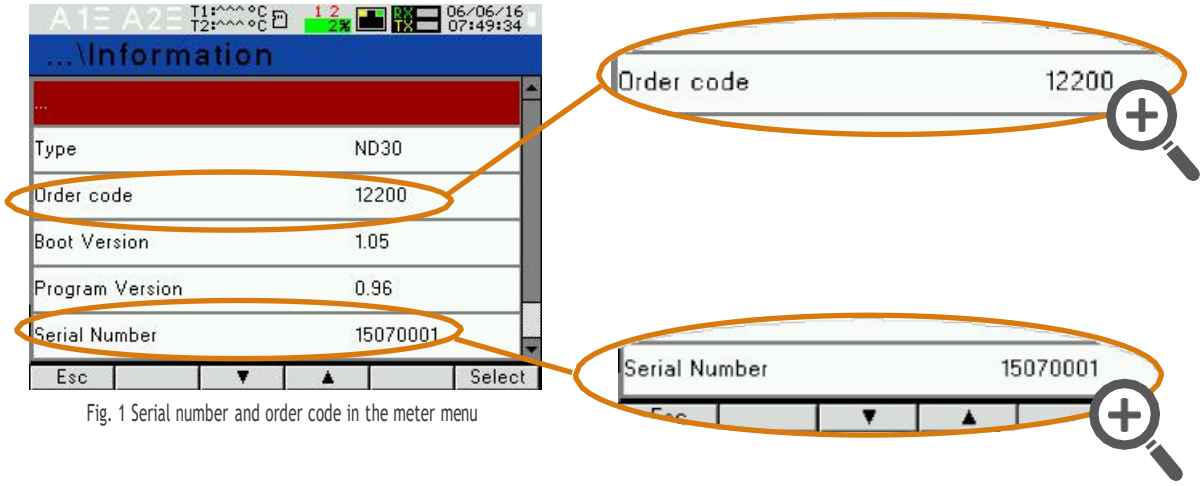


Fig. 1 Serial number and order code in the meter menu