

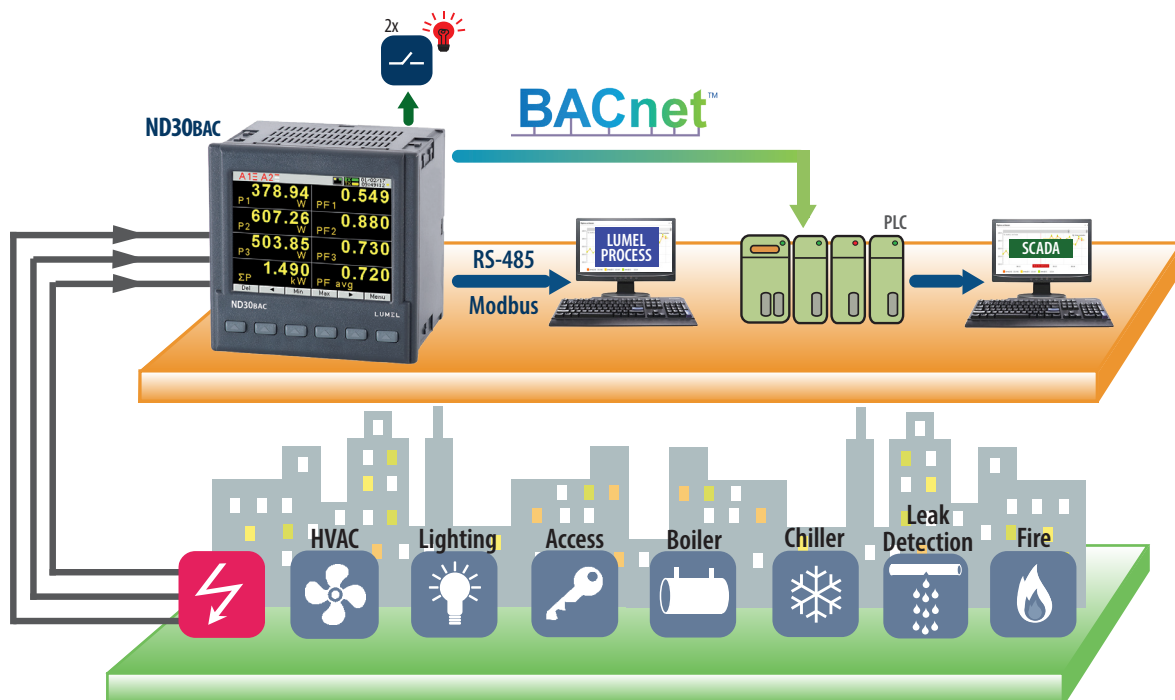


ND30BAC - METER OF POWER NETWORK PARAMETERS WITH BACnet

- **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.
- **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 vies, 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 BACnet/ IP interface.
- 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
- three phase total power factor: total $3PF_T$
- 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_s
- mean phase-to-phase voltage: U_{mf}
- mean 3-phase current: I_s
- 15, 30, 60 minutes mean active/reactive/apparent power: $P_{demand}, Q_{demand}, S_{demand}$ and mean current I_{demand}
- active, reactive and apparent 3-phase energy: EnP, EnQ, EnS
- 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)

FEATURES	INPUT	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 W19999 MW (tr _U ≠1, tr _I ≠1)	•	•	•	•	0.5 (EN 61557-12)
Reactive power Q	-19999 MVar .. 0,000 Var19999 MVar (tr _U ≠1, tr _I ≠1)	•	•	•	•	1 (EN 61557-12)
Apparent power S	0.000 .. 1999,9 VA19999 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...65.00...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 $U_{h2} \dots U_{h51}$ and current $I_{h2} \dots I_{h51}$	0.0 ..100.0 %	•	•	•		II (IEC61000-4-7)

tr_I - Current transformer ratio = Primary current of the transformer / Current of the current transformer,
tr_U - Transmission of voltage transformer = Primary voltage of the transformer / Secondary voltage of the voltage transformer

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
BACnet	BACnet/IP	BACnet Standardized Device Profile (Annex L): BACnet Application Specific Controller (B-ASC); BACnet Interoperability Building Blocks (BIBB) Support (Annex K in BACnet Addendum 135d): DS-RP-B, DS-WP-B, DS-RPM-B, DM-DDB-B, DM-DOB-B, DM-DCC-B, DM-RD-B; Binding methods support: Recive Who-Is, send I-Am (BIBB, DM-DDB-B); Recive Who-Has, send I-Have (BIBB DM-DOB-B)

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

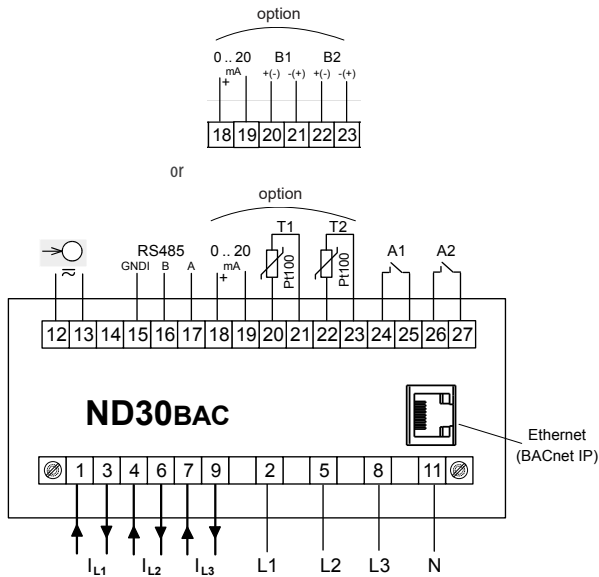
RATED OPERATING CONDITIONS

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...1.2 Un for current, voltage, PF, tgφ	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	

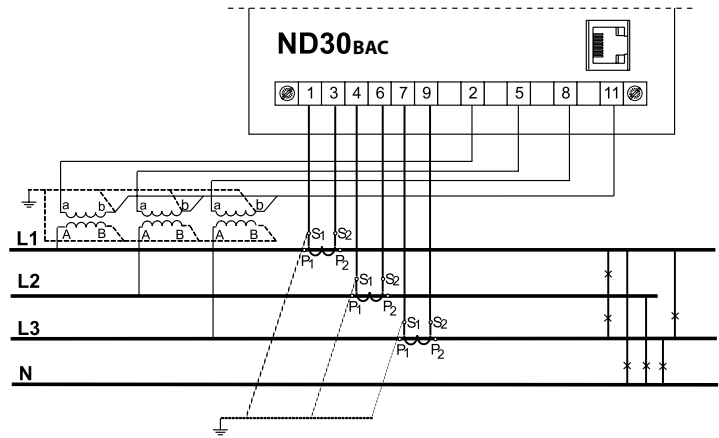
SAFETY AND COMPATIBILITY REQUIREMENTS

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	<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, analog outputs, temperature and binary inputs: 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

DISPLAYING OF MEASUREMENT PARAMETERS

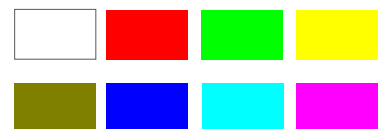
A1 A2		15/03/24 11:33:16	
225.48	1.005	U1	I1
V	A		
228.91	2.105	U2	I2
V	A		
231.22	1.805	U3	I3
V	A		
49.999	1.638	f	I avg
Hz	A		
Del	◀	Min	Max ▶
Menu			

A1 A2		15/03/24 12:02:57	
225.48	226.57	U1	S1
V	VA		
1.005	0.913	I1	PF1
A			
206.88	0.447	P1	tg1
W			
92.387	49.999	Q1	f
var	Hz		
Del	◀	Min	Max ▶
Menu			

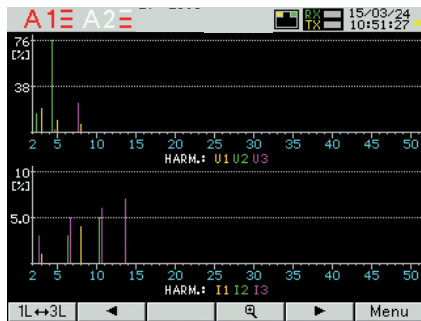
A1 A2		15/03/24 13:04:26	
843.80	21 660 807.201	ΣP	En P+
W	kWh		
726.01	2 786 343.635	ΣQ	En P-
var	kWh		
1.126	13 760.862	ΣS	En Q±
kVA	kvarh		
24 853 934.200	12 035.698	En S	En Q+
kVAh	kvarh		
Del	◀	Min	Max ▶
Menu			

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

Available colors for digital indications:



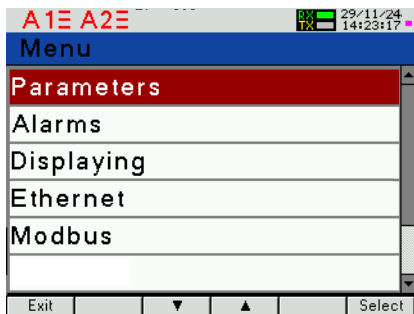
DISPLAYING OF MEASUREMENT PARAMETERS



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

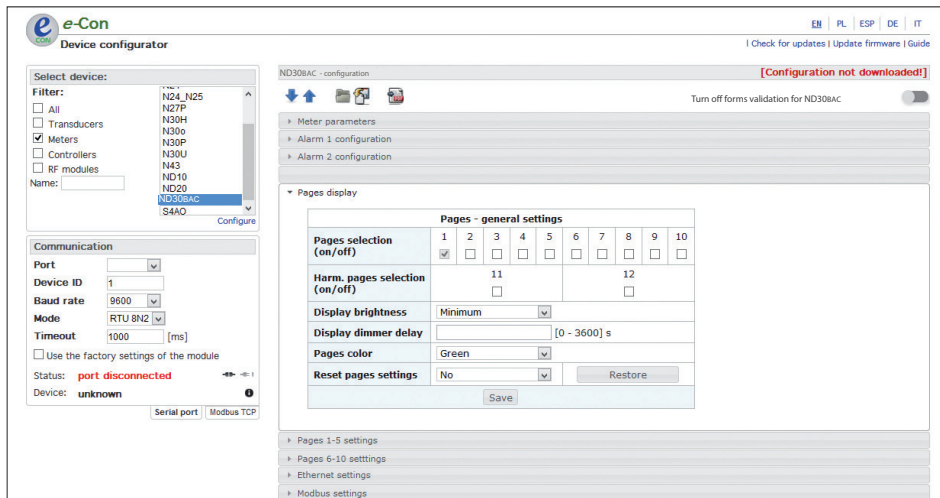


presentation in the form of analog meter view with min/max preview for display value and zoom function



easy to use and intuitive menu; information bar with status of: phase sequence, alarm outputs, temperature or binary inputs, interfaces, time and date

METER CONFIGURATION WITH FREE eCON SOFTWARE



ability to configure and update ND30BAC with free eCon software (via RS-485)

ORDERING CODE

Meter ND30BAC	X	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 Pt100 inputs	2						
2 relays, 1 analog output, 2binary inputs (galvanically separated)	3						
Interface:							
BACnet/IP and RS485(Modbus RTU)	2						
Supply:							
85...253 V a.c., 90...300 V d.c.				1			
20...40 V a.c., 20...60 V d.c.				2			
Version:							
standard					00		
custom-made*					XX		
Language:							
Polish/ English						M	
other*						X	
Acceptance tests:							
without additional quality requirements							0
with an extra quality inspection certificate							1
with calibration certificate							2
acc.to customer's request*							X

* only after agreeing with the manufacturer

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