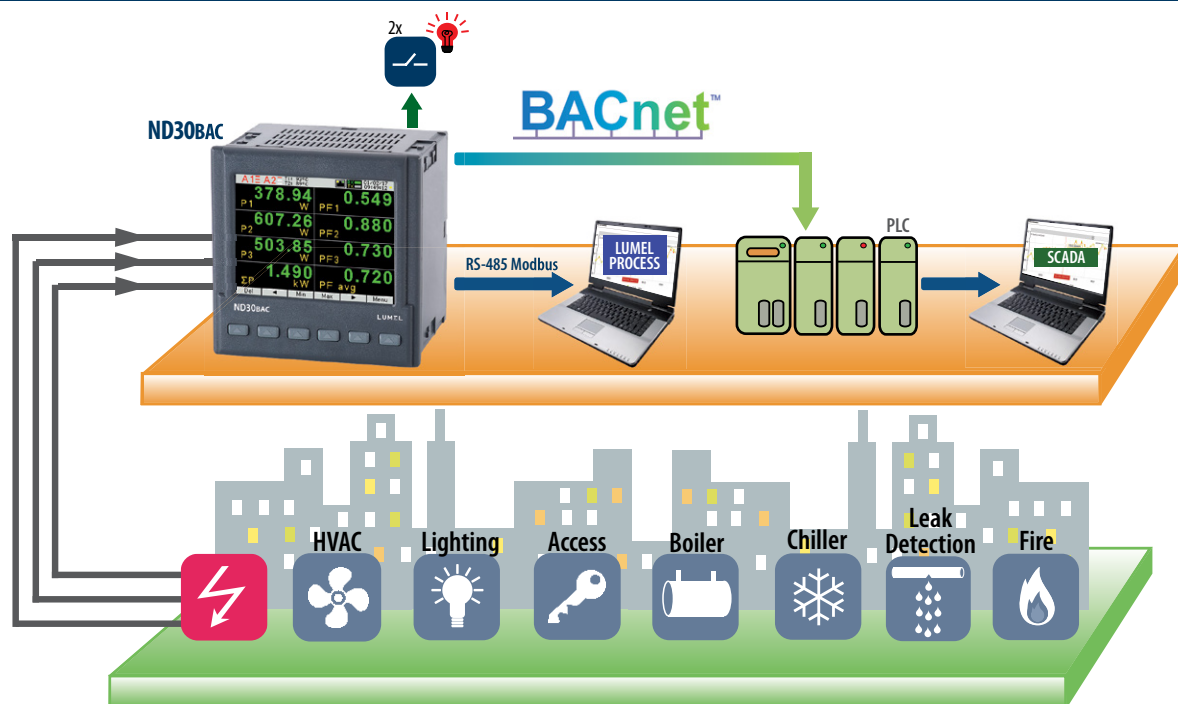




## ND30<sub>BAC</sub> - METER OF POWER NETWORK PARAMETERS WITH BACnet

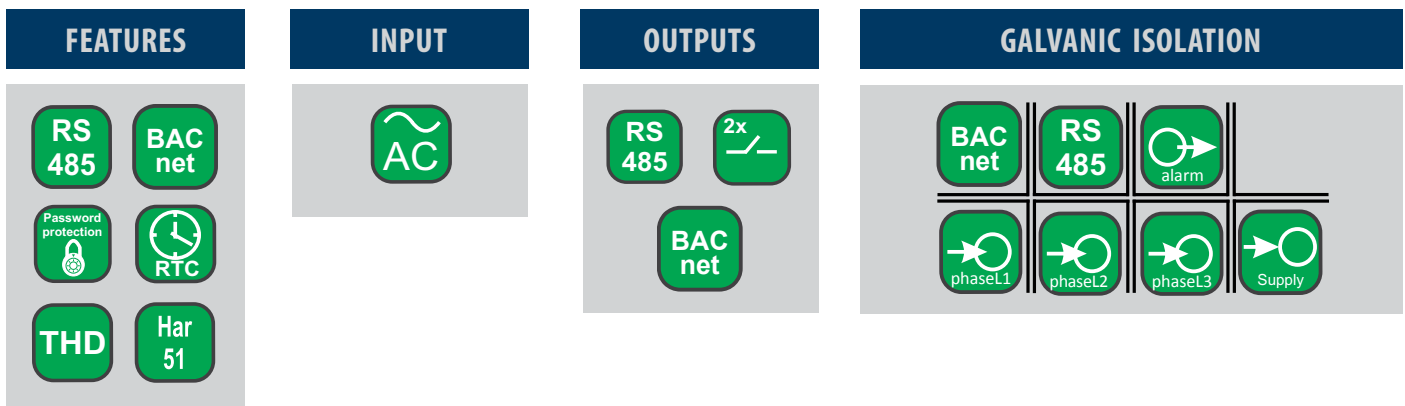
- **Measurement** of 54 power network parameters, including **current and voltage harmonics up to 51st**, in 1-phase 2-wire or 3-phase 3 or 4-wire balanced and unbalanced systems.
- **Graphical color display:** LCD TFT 3,5", 320 x 240 pixels, **fully configurable by a user** (10 vies, 8 parameters in each).
- Indications include the values of programmed ratios.
- Memory of minimum and maximum values.
- 2 configurable alarm outputs.
- 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 51 st! (not available via BACnet).



## TECHNICAL DATA

### MEASURING RANGE

Measured value	Measuring range	L1	L2	L3	$\Sigma$	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 <sub>i</sub>	.. (-)1999.9 W ..(-)1999.9 MW (tr_U≠1, tr_I≠1)	•	•	•	•	Class 0.5
Reactive power Q <sub>i</sub>	.. (-)1999.9 Var ..(-)1999.9 MVar (tr_U≠1, tr_I≠1)	•	•	•	•	Class 1
Apparent power S <sub>i</sub>	..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 <sub>i</sub>	-1.00 ..0 ..1.00	•	•	•	•	± 0.01 of basic error
Coefficient tgφ <sub>i</sub> (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 <sub>h1</sub> ... U <sub>h50</sub> / and current I <sub>h1</sub> ... I <sub>h50</sub>	0.0 ..100.0 %	•	•	•		Class 5 50 / 60 Hz

tr\_I, tr\_U – ratio of current and voltage transformer

## 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

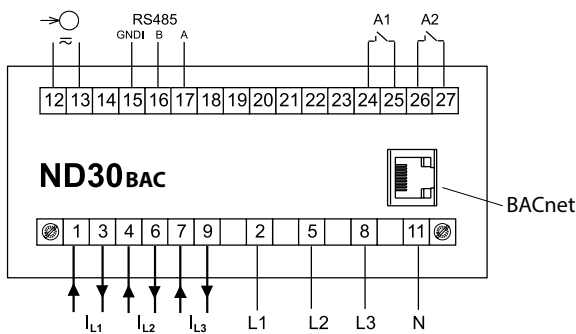
## RATED OPERATING CONDITIONS

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 <sub>p</sub>	frequency 45...50...60...65 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

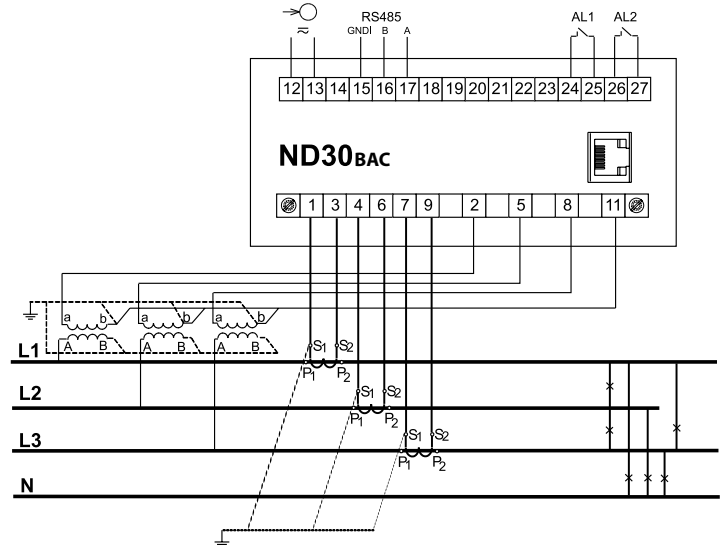
## SAFETY AND COMPABILITY REQUIREMENTS

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	<ul style="list-style-type: none"> <li>for supply circuit and relay outputs 300 V</li> <li>for measuring input 500 V</li> <li>for circuits of RS-485, Ethernet, pulse input and output, analog outputs: 50 V</li> </ul>	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

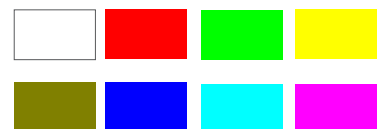
A1E A2E		15/03/16 11:33:16	
225.48	1.005	U1	I1
V	A		
228.91	2.105	U2	I2
V	A		
231.22	1.805	U3	I3
V	A		
49.999	1.638	f	I avg
Hz	A		
Del	◀	Min	▶
Menu			

A1E A2E		15/03/16 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	▶
Menu			

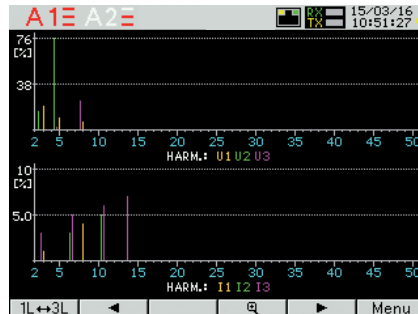
A1E A2E		15/03/16 13:04:26	
843.80	21 660 807.201	ΣP	En P+
W	kWh		
726.01	2 786 343.635	ΣQ	En P-
var	kWh		
1.126	13 760.862	ΣS	En Q#
kVA	kvarh		
24 853 934.200	12 035.698	En S	En Q+
kVAh	kvarh		
Del	◀	Min	▶
Menu			

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

Available colors for digital indications:



DISPLAING OF MEASUREMENT PARAMETERS

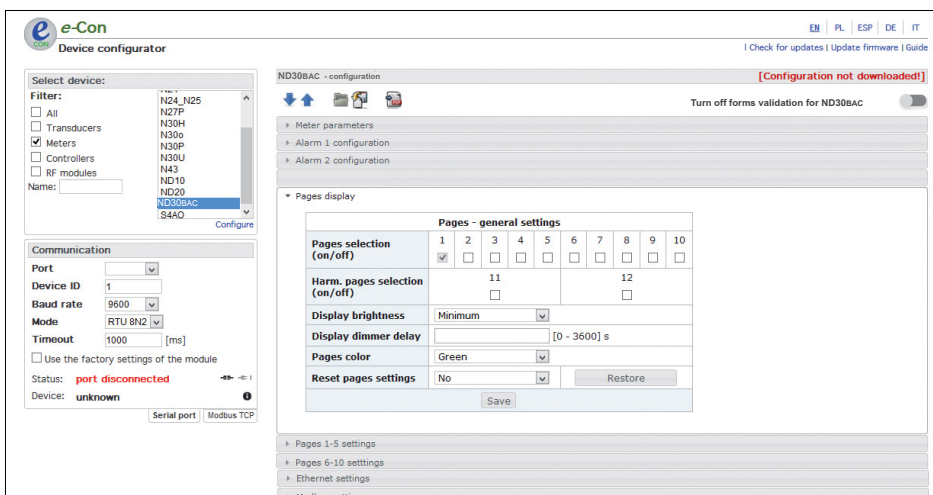


two screens dedicated to harmonics;  
indication of individual harmonic  
for voltages and currents (up to 51st);  
bargraph presentation for all harmonics  
with zoom function



easy to use and intuitive menu;  
information bar with status of: phase  
sequence, alarm outputs and 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
<b>Input voltage (phase/phase-to-phase) Un:</b>							
3 x 57.7/ 100 V, 3x 230/ 400 V	1						
3 x 110/ 190 V, 3 x 400/ 690 V	2						
<b>Additional outputs /inputs:</b>							
2 relays		1					
<b>Interface:</b>							
BACnet/IP and RS485(Modbus RTU)			2				
<b>Supply:</b>							
85...253 V a.c., 90...300 V d.c.				1			
20...40 V a.c., 20...60 V d.c.				2			
<b>Version:</b>							
standard					00		
custom-made*					XX		
<b>Language:</b>							
Polish						P	
English						E	
other*						X	
<b>Acceptance tests:</b>							
without additional quality requirements							0
with an extra quality inspection certificate							1
acc.to customer's request*							X

\* 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



**KSS** - synchronizing meter



**N43** - rail mounted 3-phase power network meter



**P43** - 3-phase transducer of power network parameters



Current transformers from 5 A up to 6 kA

For more information about Lumel products please visit our website:

[www.lumel.com.pl](http://www.lumel.com.pl)



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