

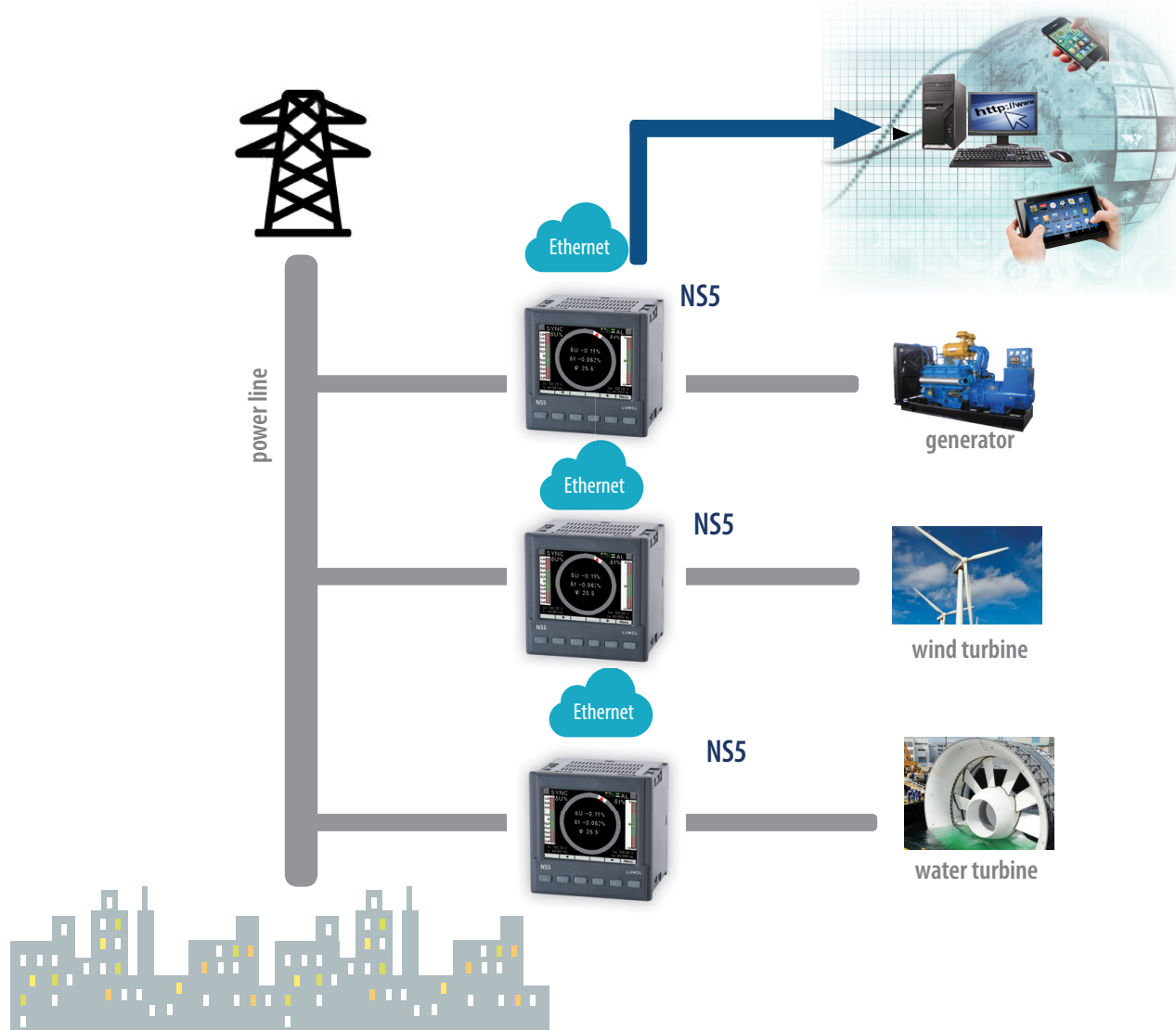


NS5 - SYNCHRONIZATION METER

- Clear data visualization thanks to color graphic display 3.5" TFT (separately for the synchroscope, differential voltmeter, frequency meter);
- Range of input signals: 50...150 V or 150...400 V;
- Direct or indirect measurement through voltage transformers;
- Additional control inputs: BLK - lock synchronization, START - start synchronization
- Programmable hysteresis of voltage difference, frequency, and phase shift angle
- **Ethernet interface 10/100 BASE-T** for connecting the synchronization meter to the local area network (LAN) or the global one (WAN);
- Network services: web server, Modbus TCP / IP, DHCP server;
- RS-485 interface with Modbus RTU protocol;
- Password protection for two accounts of Web Server user,
- Measurement of the minimum and maximum values of voltage and frequency
- External dimensions: 96 x 96 x 77mm.



EXAMPLE OF APPLICATION



FEATURES	INPUTS	OUTPUTS	GALVANIC ISOLATION

TECHNICAL DATA

MEASURING RANGE

Measured value	Measuring range	Resolution	Class/ basic error
Voltage Un: 50 ... 150 V~ 150 ... 400 V~	20 ... 180 V 60 ... 480 V ... 1920 kV (tr_U≠1)	0.1 V 0.1 V 0.01 kV	0.2 (EN 61557-12)
Voltage difference ΔU	-20..0..20 %	0.1%	0.5 (EN 61557-12)
Frequency f	45 ..65 Hz	0.001 Hz	0.02 (EN 61557-12)
Frequency difference Δf	-10..0..10 %	0.01%	0.02 (EN 61557-12)
Phase shift φ	0..360°	0.1°	±0.5°

tr_U - ratio of voltage transformer = transformer primary voltage / transformer secondary voltage

INPUTS

Input type	Properties
Control inputs (BLK, START)	2 voltage input 20..250 V d.c./a.c. Power consumption per input ≤ 0.25 W

OUTPUTS

Output type	Properties
Relay outputs (AL, SYNC)	2 programmable relays, NO contacts, resistance load 0.5 A/250 V a.c. or 5 A/30 V d.c.; activation time of the relay - max. 8 ms; Number of switching: mechanical - minimum 5×10^6 , electrical - minimum 1×10^5

Refers to NS5-XXX01XX special version:
2 programmable relays, volt free NO contacts, resistive load 1 A / 300 V a.c. / d.c.
Relay operate time 10 ms (max),
Number of switchings: mechanical minimum 3×10^7 ,
electric minimum 3×10^4

DIGITAL INTERFACE

Interface type	Transmission protocol	Remarks
RS-485	Modbus RTU 8N2, 8E1, 8O1, 8N1 Adres 1..247	baud rate: 4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s
Ethernet 10/100 Base-T	Modbus TCP/IP, DHCP client	RJ45 socket, WWW server

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

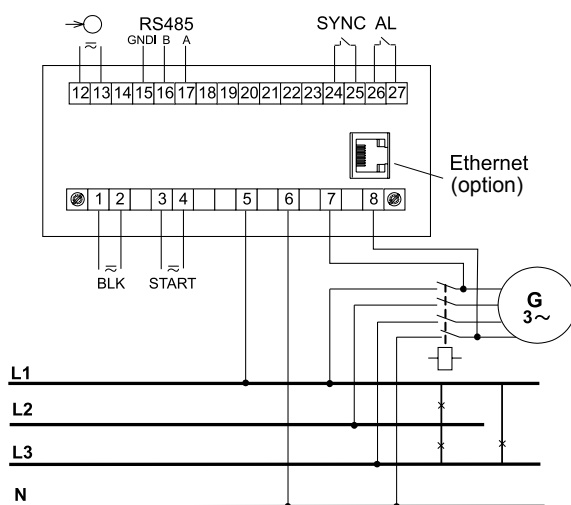
RATED OPERATING CONDITIONS

Supply voltage	→ 85..253 V a.c. (40..50..400) Hz or 90..300 V d.c. or 20..40 V a.c. (40..50..400) Hz or 20..60 V d.c.	
Power consumption	in supplying circuit ≤ 6 VA	in voltage circuit ≤ 0.5 VA
Input signal	0.2..0.4..1.2 U _n	frequency 45..50..60..65 Hz, sinusoidal (THD ≤ 8%)
Phase shift	0 .. 360° for frequency f _n ± 5 Hz (for f _n = 50 or 60 Hz)	
Preheating time	15 min.	
Ambient temperature	-10 .. 23 .. 55°C, class K55 acc. to EN 61557-12	
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 U _n (5 sek.)	
Admissible crest factor	current: 2	

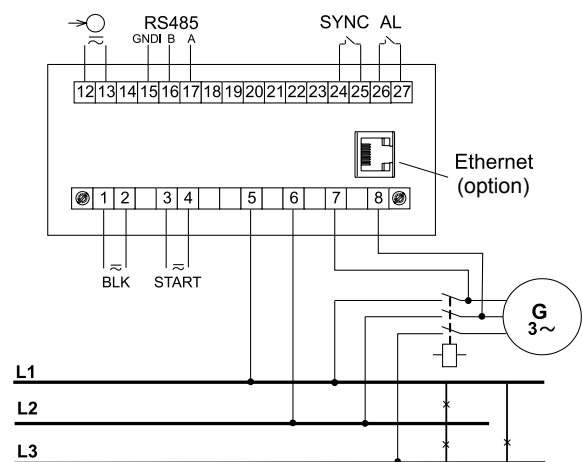
SAFETY AND COMPABILITY REQUIREMENTS

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 for phase-to-earth voltages up to 300 V	acc. to EN 61010-1
Maximal phase-to-earth voltage	<ul style="list-style-type: none"> for supplying circuits and relay outputs 300 V for measuring inputs 300 V for circuits RS-485, Ethernet: 50 V 	acc. to EN 61010-1
Altitude a.s.l.	< 2000 m	

CONNECTION DIAGRAMS

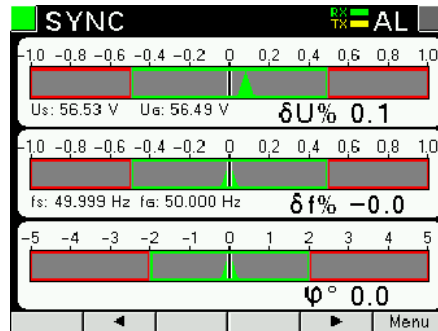
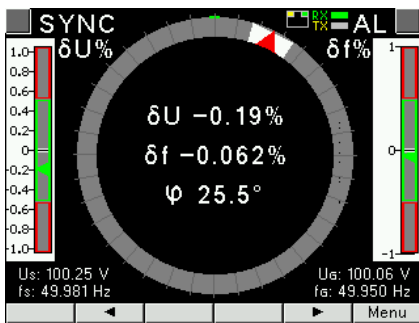


Meter connections -
measurement phase voltages

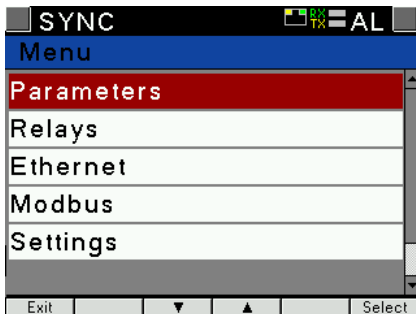


Meter connections -
measurement phase-to-phase voltages

DISPLAYING OF MEASUREMENTS PARAMETERS

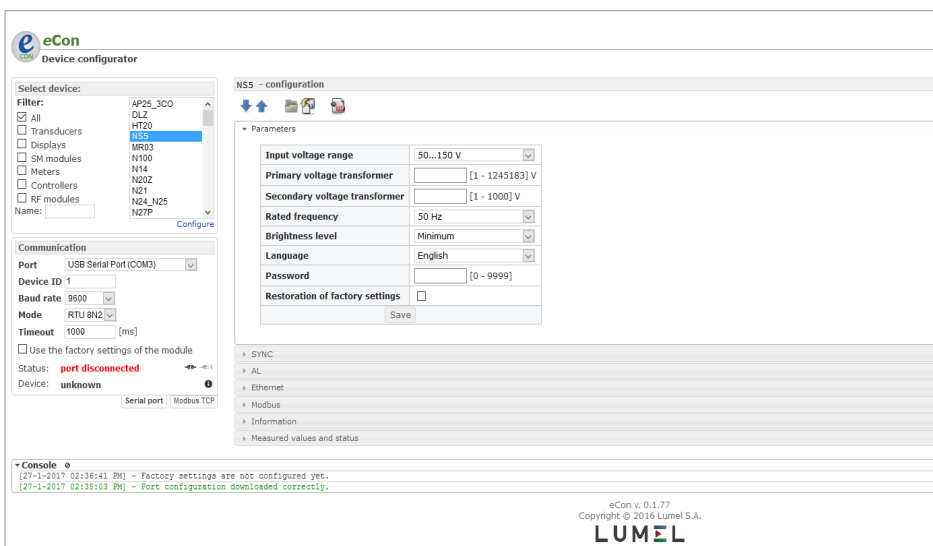


Visualization of measurement
(synchroscop, bargraphs)



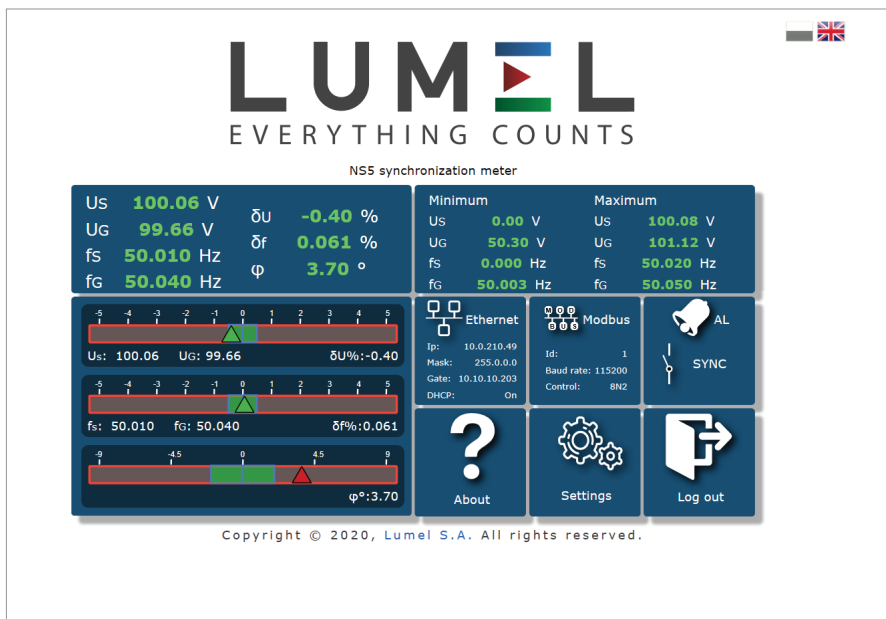
easy to use and intuitive menu

METER CONFIGURATION WITH FREE eCON SOFTWARE



ability to configure and update NS5
with free eCon software
(via RS-485 or Ethernet interface)

REMOTE READOUT OF PARAMETERS THROUGH ETHERNET: WWW SERVER



WEB server for remote reading of current measurement data

ORDERING CODE

	NS5	X	X	X	XX	X	X
Input voltage Un*:							
50...150 V		1					
150...400 V		2					
Interface:							
RS-485			1				
RS-485 and Ethernet			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 G234 relay 1A/300V a.c./d.c.					01		
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

* Un - phase and phase-to-earth voltage (programmable in selected range); maximal phase-to-earth voltage 300 V,

** after agreeing with the manufacturer

Order example:

The code: **NS5 12100M0** means:

NS5 –synchronization meter

1 – input voltage 50...150 V,

2 – RS485 and Ethernet,

1 –supply 85..253 V a.c., 90..300 V d.c.

00 – standard version,

M - Polish/English language version,

0 - without additional quality requirements.

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NS5-19_en