

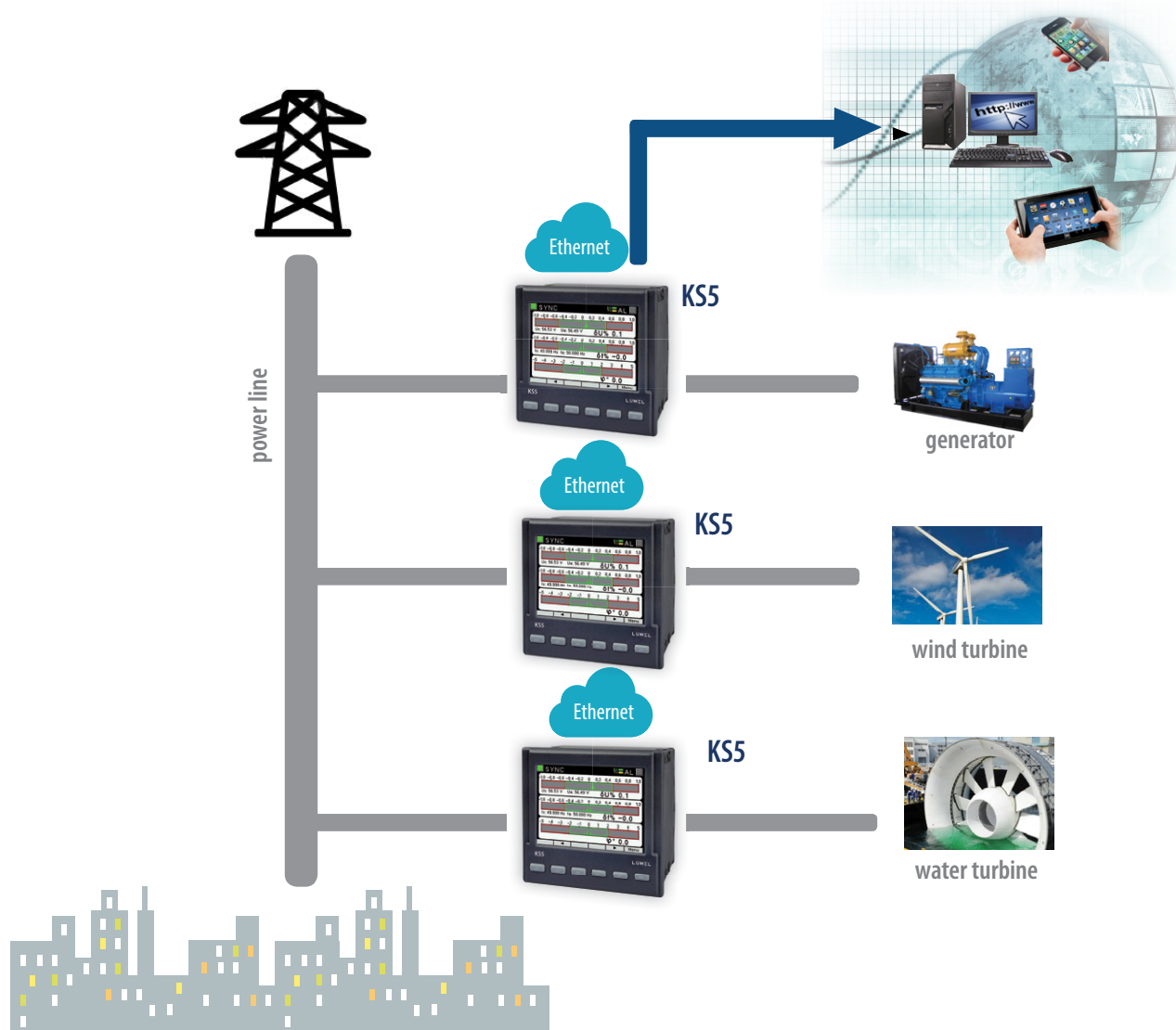
NEW












KS5 - 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 x 10 ⁶ , electrical - minimum 1 x 10 ⁵ |

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 |

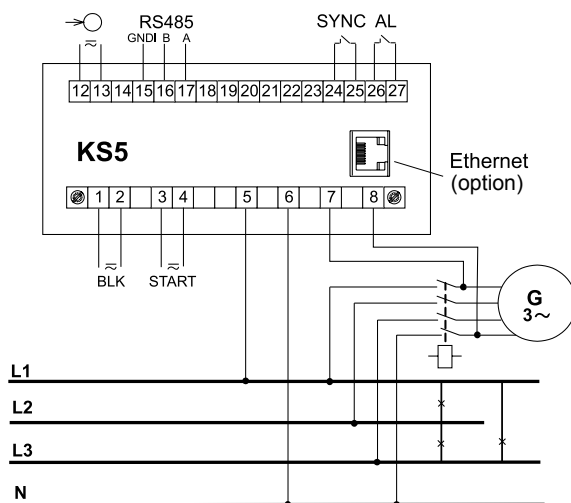
RATED OPERATING CONDITIONS

| | | |
|-------------------------|---|--|
| 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 | |

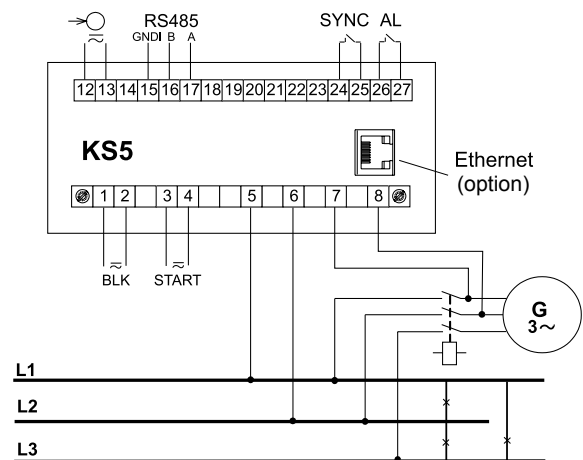
SAFETY AND COMPABILITY REQUIREMENTS

| | | |
|---------------------------------|---|----------------------|
| 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

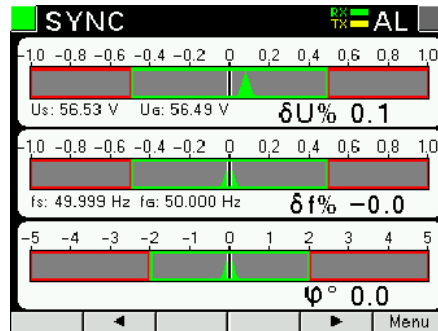
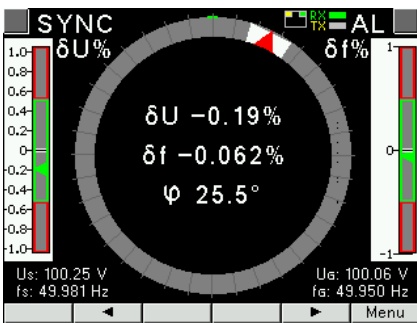


Meter connections -
measurement phase voltages



Meter connections -
measurement phase-to-phase voltages

DISPLAYING OF MEASUREMENTS PARAMETERS

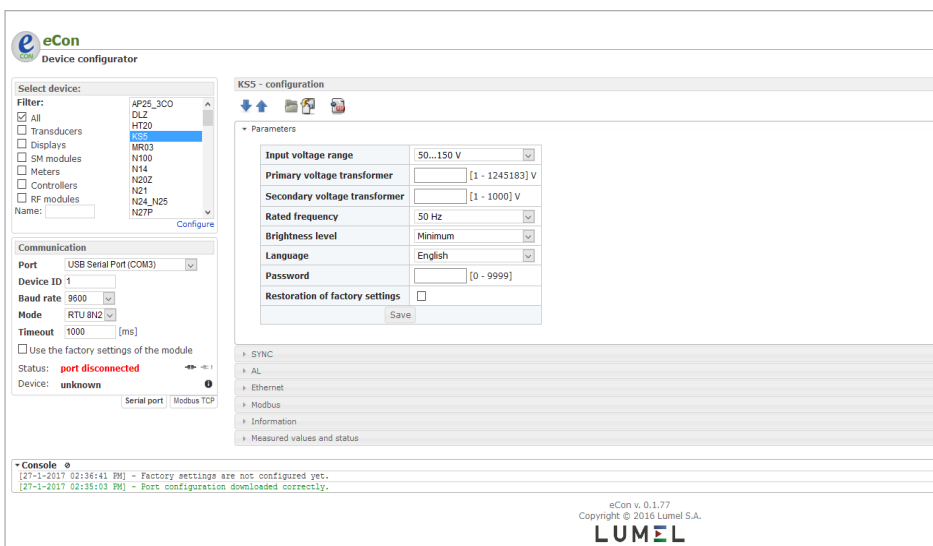


Visualization of measurement
(synchroscop, bargraphs)



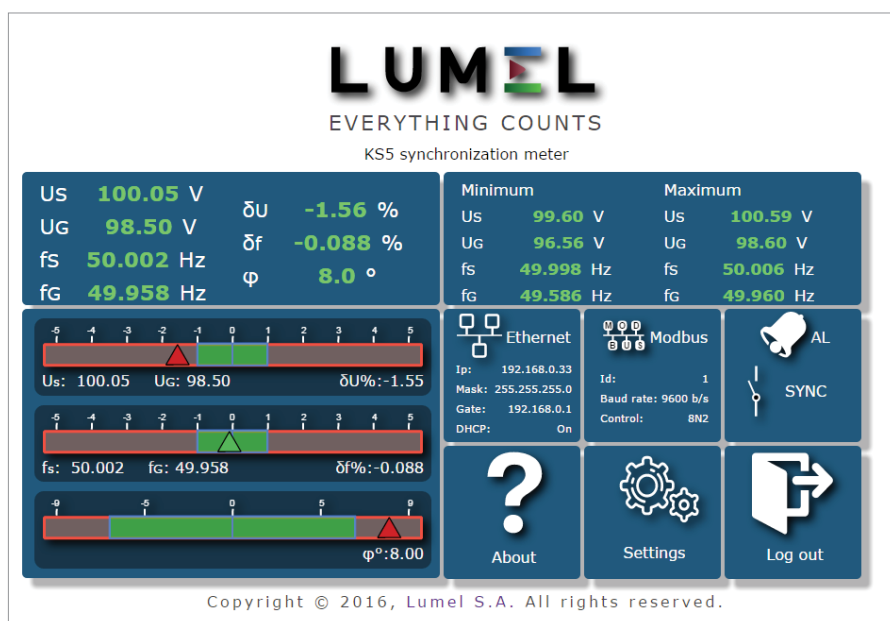
easy to use and intuitive menu

METER CONFIGURATION WITH FREE eCON SOFTWARE



ability to configure and update KSS
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

| | | | | | | | |
|--|-------|---|---|---|----|---|---|
| | KS5 - | 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** | | | | | 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 |

* 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: **KS5-1 2 1 00 E 0** means:

- KS5 –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,
- E - user's manual in English
- 0 - without additional quality requirements.

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KS5-19_en

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