

**DATASHEET**

Issue 1.0

**Multifunction Meters****Transducers & Isolators****Temperature Controllers****Converters & Recorders****Digital Panel Meters****Current Transformers****Analogue Panel Meters****Shunts****Digital Multimeters****Clamp Meters****Insulation Testers**

KS5 SYNCHRONIZATION METER

Features

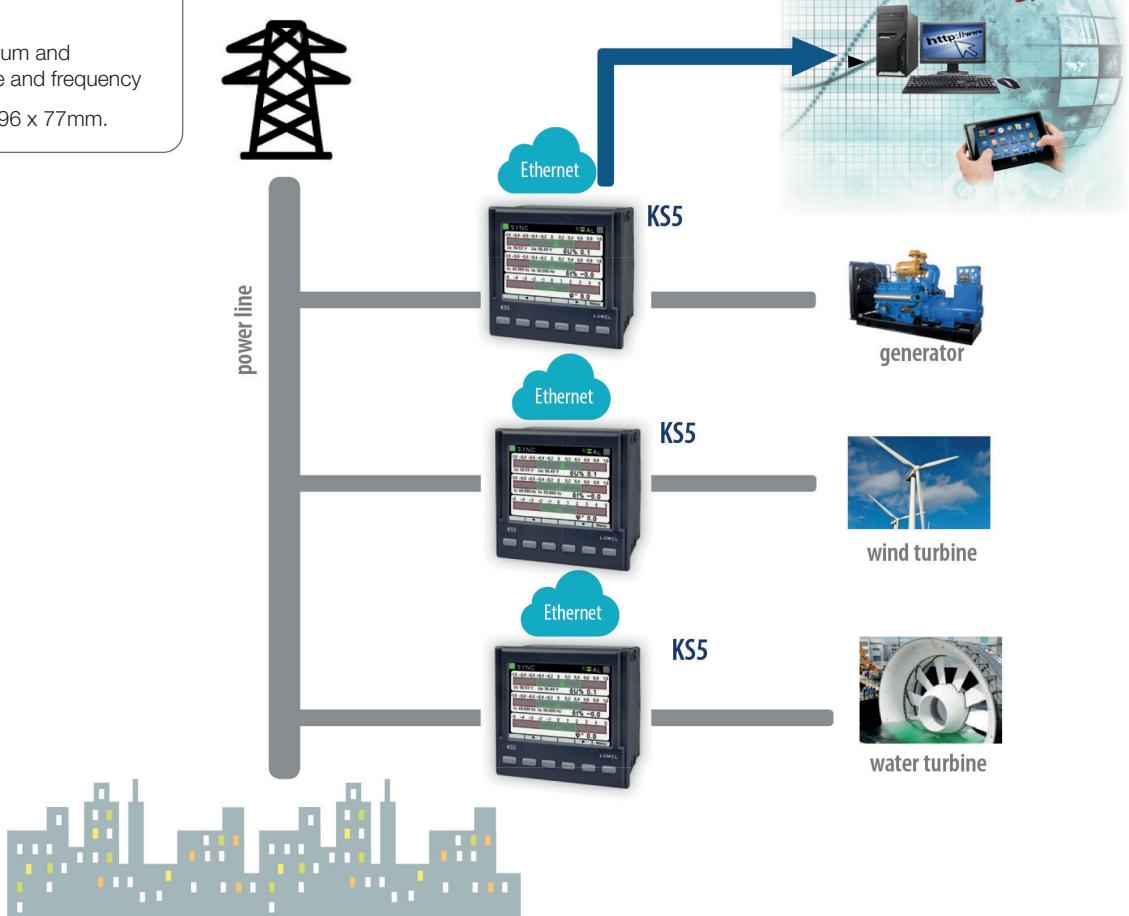
- Clear data visualization thanks to color graphic display 3.5" TFT (separately for the synchroscope, differential voltmeter, frequency meter);
- Range of input signals: 50...150 V or 150...400 V;
- Direct or indirect measurement through voltage transformers;

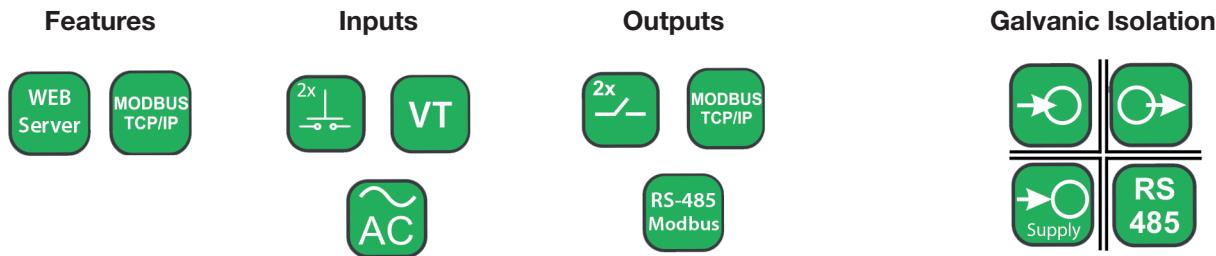
SUBJECT TO CHANGE WITHOUT NOTICE

This manual superseded all previous versions – please keep for future reference

Features

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- Range of input signals: 50...150 V or 150...400 V;
- Direct or indirect measurement through voltage transformers;
- Additional control inputs: BIK - 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




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

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

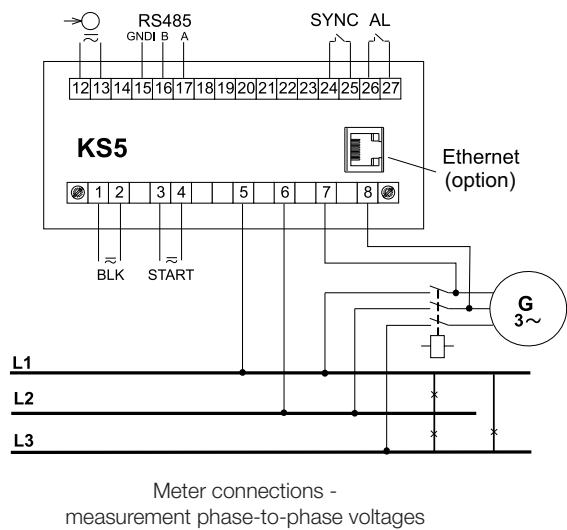
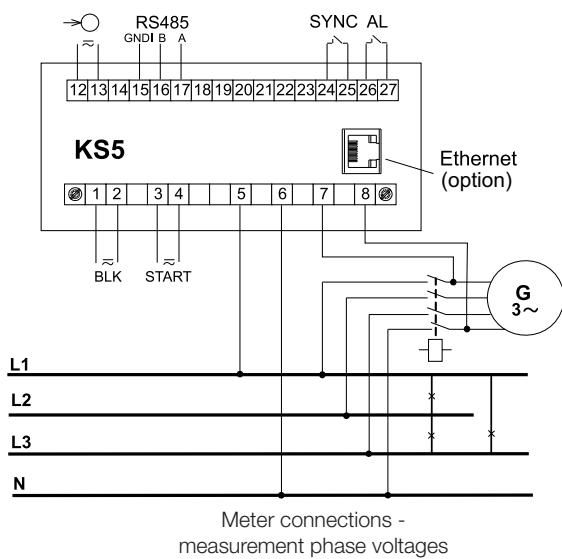
RATED OPERATING CONDITIONS

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 $f_n \pm 5$ 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	

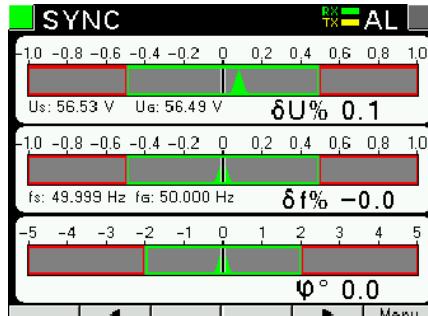
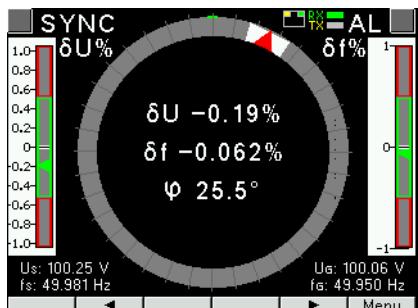
SAFETY AND COMPABILITY REQUIREMENTS

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
Polution 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



Displaying of Measurement Parameters



Visualization of measurement (synchroscope, bargraphs)



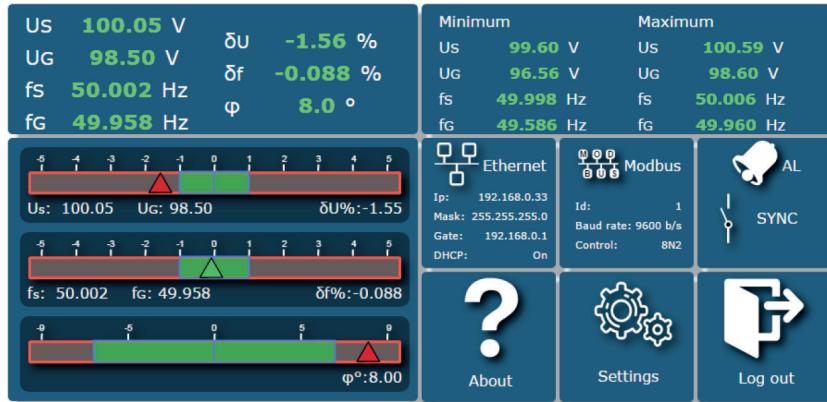
Easy to use and intuitive menu

Meter Configuration with Free eCon Software

eCon
Device configurator
Select device:
Filter: AP25_3CO
All Transducers DLZ HT20
Displays MR03
SM modules N100
Meters N14
Controllers N202
RF modules N21 N24_N25 N27P
Name: Configure
Communication
Port: USB Serial Port (COM3)
Device ID: 1
Baud rate: 9600
Mode: RTU BN2
Timeout: 1000 [ms]
Use the factory settings of the module
Status: port disconnected
Device: unknown
Serial port Modbus TCP
Console
[27-1-2017 02:36:41 PM] - Factory settings are not configured yet.
[27-1-2017 02:35:03 PM] - Port configuration downloaded correctly.

KSS - configuration
Parameters
Input voltage range: 50...150 V
Primary voltage transformer: 1 - 1245183 V
Secondary voltage transformer: 1 - 1000 V
Rated frequency: 50 Hz
Brightness level: Minimum
Language: English
Password: 0 - 9999
Restoration of factory settings: Save
SYNC AL Ethernet Modbus Information Measured values and status

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

	K55 -	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: **K55-1 2 1 00 E 0** means:

K55 – 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.

Contact



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