

# CERTIFIED POWER SYSTEM ANALYSIS

MOBILE POWER QUALITY AND  
ENERGY CONSUMPTION  
MONITORING



**LINAX PQ5000 MOBILE**

IEC 61000-4-30 ED. 3.0 CLASS A  METAS



## MOBILE POWER QUALITY AND ENERGY CONSUMPTION MONITORING



Power grids ensure that consumers can be supplied with electrical energy. The requirements for the quantity, availability and quality of the energy vary according to the consumer and are therefore contractually agreed between the consumer and the supplier. This way a trouble-free operation of customer installations should be ensured without unduly influencing other energy consumers on the same network.

By means of the mobile measurement solution **LINAX PQ5000-Mobile** the operational aspects of the energy supply can be verified:

- Quality of supply
- Availability of supply
- Evaluation of changes or improvement measures
- Energy flow analysis

This measurement solution supports campaigns (repeated measurements at the same location) by a configuration manager with up to 20 storable device settings, can provide a WLAN access point for connecting mobile devices and provide all data for evaluation via the device's own website. In order to be able to validate the power quality at the measuring location, the duration of the measurement should be at least 7 full days.

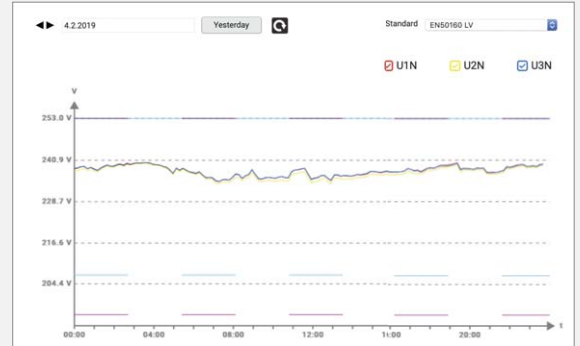


# MONITORING OPTIONS AND BENEFITS

## Statistical evaluation (Quality of supply)

PQ conformity assessment according to EN50160, IEC61000-2-2/2-4/2-12, GB/T, IEEE519, own limits

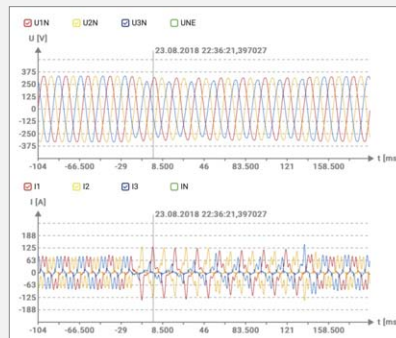
- Ensure trouble-free operations of the loads
- Delivery contract complied?



## Recording of malfunctions (Availability of supply)

Detection of voltage events (dip, interruption, swell, rapid voltage changes, ripple control)

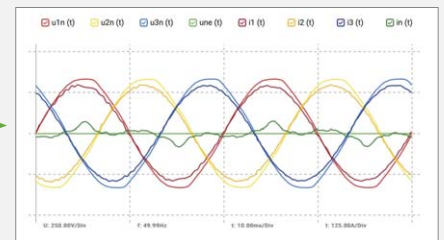
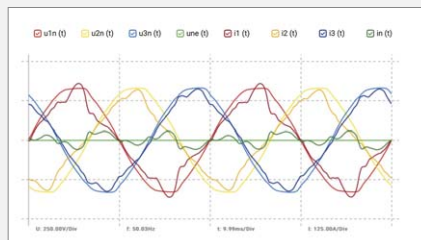
- Find the sources of disturbances and correct them



## Evaluation of changes or improvement measures

Evaluate changes to the installation by comparing the results

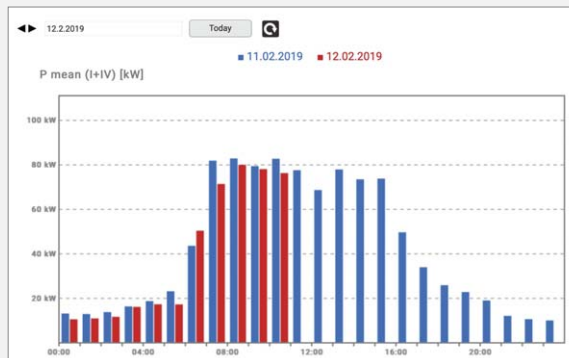
- Desired improvement?
- Side effects?



## Energy flow

Acquisition of load profiles, short-term load peaks and metering values

- Save costs due to energy management



time	P (I+IV) [kW]	min P (I+IV) [kW]	max P (I+IV) [kW]
12.02.2019 00:05:00,000	9.01	5.34	16.64
12.02.2019 00:10:00,000	9.45	5.29	30.01
12.02.2019 00:15:00,000	12.39	5.96	30.73
12.02.2019 00:20:00,000	13.38	5.85	17.93
12.02.2019 00:25:00,000	9.99	5.81	32.74
12.02.2019 00:30:00,000	9.17	5.82	18.2
12.02.2019 00:35:00,000	10.28	5.78	31.24
12.02.2019 00:40:00,000	9.62	5.77	29.61
12.02.2019 00:45:00,000	6.74	5.65	15.95
12.02.2019 00:50:00,000	10.44	5.74	26.92
12.02.2019 00:55:00,000	14.05	5.8	32.1
12.02.2019 01:00:00,000	12.45	5.7	17.48
12.02.2019 01:05:00,000	16.94	12.18	37.18
12.02.2019 01:10:00,000	8.27	5.79	31.4
12.02.2019 01:15:00,000	11.24	7.16	17.69
12.02.2019 01:20:00,000	11.16	7.21	30.85
12.02.2019 01:25:00,000	10.71	7.4	32.33
12.02.2019 01:30:00,000	9.51	5.76	29.22





# CONNECTION OPTIONS AND VARIANTS

**SECURE COMMUNICATION**

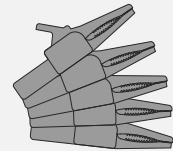
- Password
- https
- Client whitelist



Lockable and waterproof



U<sub>1,2,3,N,PE</sub>



Direct measurement via fused voltage taps

I<sub>1,2,3,N</sub>

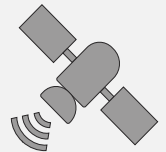
Rogowski coils or current clamps



WLAN

Commissioning, configuration, data analysis

GPS



Time synchronisation

LAN



## ACCESSORIES



fused voltage taps (always included)



Current clamps



Rogowski coils



GPS receiver for time synchronisation



## OPERATION AND EVALUATION

No software is required for the parameterization of the device or the evaluation of the measurement results. The **WEB interface** of the device provides all required functions. These can be used via mobile phone, tablet or laptop via the LAN or WLAN interface.



Status bar

- Measurement data visualization
- Status bar for network LAN + WLAN, alarms, recording
- Service functions
- PQ Easy-Report for compliance reports
- Complete device parameterization
- Support for measurement campaigns (up to 20 configurations)
- Data export in CSV format (load profiles, waveform, event lists)

## PQ EASY-REPORT



- PDF creation via WEB interface of the device
- Selectable report duration
- Selectable report scope (overview, statistic details, event overview)
- Direct compliance assessment of standards EN 50160, IEC 61000-2-2 / 2-4 / 2-12, GB/T, IEEE 519 or customer specific limits
- Customer specific logo in the report



## CERTIFIED POWER QUALITY MONITORING

- Independent certification by Federal Institute of Metrology
- Device type PQI-A FI2 acc. IEC 62586-1
- Proven at 230V / 50 Hz and 120V / 60Hz
- Flicker meter class F1
- Flagging concept: Multiphase approach in accordance with IEC 61000-4-30



Thanks to the certification according to IEC 62586-2 (standard for verifying compliance with IEC 61000-4-30) the device can serve as a reliable and comparable source of information for regulatory agencies, for negotiations with energy suppliers or for internal quality control.



## TECHNICAL DATA

<b>INPUTS</b>		<b>INTERFACES</b>	
<b>NOMINAL VOLTAGE</b>	57.7 ... 400 V <sub>LN</sub> , 100 ... 693 V <sub>LL</sub>	<b>ETHERNET</b>	Standard
Maximum	520 V <sub>LN</sub> , 900 V <sub>LL</sub> (sinusoidal)	Physics	Ethernet 100 Base TX; RJ45 socket
Overload capacity	520 V <sub>LN</sub> , 900 V <sub>LL</sub> permanent	Mode	10/100 MBit/s, full/half duplex, autonegotiation
	800 V <sub>LN</sub> , 1386 V <sub>LL</sub> , 10x1 s, interval 10 s	Protocols	Modbus/TCP, http, NTP (time synchronisation)
Nominal frequency	42 ... <u>50</u> ... 58 Hz, 50.5 ... <u>60</u> ... 69.5 Hz	<b>WLAN ACCESS POINT</b>	Standard
<b>CURRENT SENSORS</b>	depends on the device variant	Connection	via USB socket
Rogowski coils	2000 A	<b>TIME REFERENCE</b>	Internal clock
Current clamps	10 A, 100 A or 1000 A	Clock accuracy	± 2 minutes/month (15 to 30 °C)
<b>Sampling rate</b>	18 kHz	Synchronisation	via NTP server or GPS
<b>POWER SUPPLY</b>		<b>ENVIRONMENTAL CONDITIONS, GENERAL INFORMATION</b>	
Power adapter	100 ... 230 V AC/DC	Operating temperature	-10 up to <u>15 up to 30</u> up to + 55 °C
Consumption	≤ 20 VA	Storage temperature	-25 to +70 °C
<b>TYPES OF CONNECTION</b>		Temperature influence	0.5 x basic uncertainty per 10 K
• Single phase		Long-term drift	0.5 x basic uncertainty per year
• Split phase (2-phase system)		Others	Application group II (IEC/EN 60 688)
• 3 or 4-wire balanced load		Relative air humidity	<95 % without condensation
• 3-wire unbalanced load, Aron connection		Operating altitude	≤2000 m above NN
• 3 or 4-wire unbalanced load		<b>SAFETY</b>	
<b>BASIC UNCERTAINTY</b>		Protection class	II (protective insulation, voltage inputs via protective impedance)
(additional uncertainty due to current sensors not considered)		Pollution degree	2
Voltage, current	±0.1 %	Protection	IP65 (closed housing)
Power	±0.2 %	Measurement category	600 V CAT III / 300 V CAT IV
Power factor	±0.1°		
Frequency	±0.01 Hz		
Imbalance U, I	±0.5 %		
Harmonic	±0.5 %		
THD U, I	±0.5 %		
Active energy	Class 0.5S (IEC/EN 62 053-22)		
Reactive energy	Class 0.5S (IEC/EN 62 053-24)		



## ORDER CODE

Mobile power quality analyzer according to IEC 61000-4-30 class A, with 5 measuring cables including dolphin clamps, standard power adapter, carrying case and device manual

ORDER CODE PQ5000MOB- ....		ACCESSORIES	ARTICLE NO
<b>1. CURRENT MEASUREMENT</b>		Current clamp 10 A / 1 V for PQ5000MOB-2	182 775
Connectors for 4 current clamps (/1V)	2	Current clamp 100 A / 1 V for PQ5000MOB-2	182 808
Connector for 4 phase Rogowski probe	3	Current clamp 1000 A / 1 V for PQ5000MOB-2	182 783
<b>2. CURRENT SENSORS</b>		4 phase Rogowski current probe 2000 A for PQ5000MOB-3	181 727
None	0	Standard power adapter 100 ... 230 V AC/DC, with world plug set (included)	183 038 182 965
4 current clamps 10 A / 1 V	1	Dolphin clamp red (included)	182 709
4 current clamps 100 A / 1 V	2	Dolphin clamp blue (included)	182 717
4 current clamps 1000 A / 1 V	3	Dolphin clamp yellow/green (included)	182 725
4 phase Rogowski current probe 2000 A	A	GPS receiver 16x-LVS for PQ5000MOB, configured	181 131
<b>3. GPS TIME SYNCHRONIZATION</b>		RJ45 cable, IP protected, length 5m	183 004
Without	0	WLAN access point dongle (included)	181 701
With GPS time synchronization, with GPS receiver	7	Carrying case (included)	182 634
With GPS time synchronization, without GPS receiver	9		
<b>4. DEVICE HANDBOOK</b>			
German	D		
English	E		

## DIMENSIONS AND CONNECTIONS



Device variant with current measurement via 4-phase Rogowski probe





Device variant with current measurement via current clamps xA/1V





# GMC INSTRUMENTS

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