

# Smart Continuous Grid Monitoring Power Quality and Power Consumption



KMB systems, s.r.o

Measuring, monitoring and evaluation of power quality  
Tools and accessories for power factor control

2011 Product Range Overview

# Introduction to KMB Systems

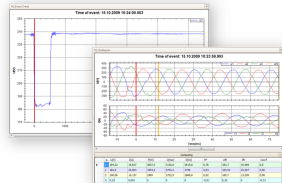


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Since 1991 our company is developing power analysers, panel meters and other appliances such as power factor controllers for supervision of the grid operation.

We develop several product lines of industrial electronics for power industry. These are covering power factor controllers (APFC), built-in and portable meters for evaluation of energy efficiency and power quality monitoring instruments.

# Introduction to Monitoring Solutions



SMxx panel meters, dataloggers and power quality analysers.  
SIMON family of compact portable dataloggers.  
ENVIS software - data acquisition, archivation and processing.



## SMV, SMP, SMPQ: Power Quality Analysers [online docs](#)

- Built-in compact power quality analysers (full featured)
- Evaluates quality according to EN 50160
- Enough memory for a long-term monitoring
- Ethernet, serial and USB communication

- Current input **x/5A, x/1A**, optional **Flexible Rogovski CT** and **x/200mA solid and split core CTs**.
- Measures direct or indirect AC voltage, wired in various 3 phase grids with up 5 wires
- Harmonic distortion, flicker indices, current and voltage unbalance,
- Active, reactive, fundamental and distortion power
- Four-quadrant, three phase, three tariff metering, with meter reading archive
- Optionally records user defined events in various forms (statistical, CBEMA, oscilograms, ...)
- Free ENVIS software for data processing

## Basic Measurement Principles - acc. IEC 61000-4-30

- Fundamental measurement cycle 10 periods/200ms
- Flagging of invalid data
- Precise time stamping and synchronisation
- (Inter-)harmonic subgroups up to 50th order

## Flicker measurement (SMPQ)

- Fulfills the requirements of IEC 61000-4-15
- By default  $P_{st} = 10$  minutes,  $P_{lt} = 2$  hours, starts at 01:00AM
- $P_{st}$  - configurable to 1,5,10,15 minutes
- $P_{lt}$  - configurable from 1 to 1008 minutes

## Recording Capabilities, Communication Options

- 1 Up to 2 GB flash memory capacity
- 2 Main archive 200 ms to 2h configurable aggregation interval, daily profiles
- 3 Event log according to IEC requirements
- 4 Half period event record of voltage and current
- 5 Event oscillogram record at 32 samples per period
- 6 Log archive recording all changes in the state of instrument
- 7 Power quality evaluation readings (SMPQ)
- 8 Electricity meter readings archive
- 9 **communication:** USB, RS232/485 or Ethernet<sup>1</sup> optional

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<sup>1</sup>Web interface, ModBus protocol, IEC 61870-5-101/104 

## SMY, SMZ: Panel Analyser with Recording Capabilities



[online docs](#)

- Cutout **SMY** 96x96 mm, **SMZ** 144x144 mm
- Improved **built-in depth only 6 cm**
- Measures and records all common quantities including harmonics and energy consumption
- Average and extreme values
- Four-quadrant kWh meter with automatic meter readings
- Record memory of up to 16Mb
- Main archive, daily profiles, supply failure log.





## SML, SMM, SMN: Three-phase panel meters [online docs](#)

- measures U, I, P, Q, PF,  $\cos\varphi$ , f, THD and Temp.
- Direct voltage input or x/100V transformer
- SMM, SML uses x/5A and x/1A current input
- SMN ships with external split core CT with various ratios
- optional remote communication - RS232, RS485
- supports M-BOX datalogger, ES and KM GPRS modules.



## SMC - Rough Network Analyser / Electricity Meter

- simple DIN-bar installation, durable displayless design
- indirect wire through CT input – secure, simple and robust
- Measurement, recording and processing of grid quantities
- Serial/USB communication to download and analyse data

SMC can be programmed and used as **a monitoring instrument and protection for compensation capacitors.**



[online docs](#)

## PA 33 - single purpose (configurable) electric quantity converter

- Simple and robust design
- Measures and converts selected quantity to its outputs
- User can define the way a quantity is exported/represented to the selected output - (U, I, P, Q, UNB, f,...)
- 2x current (4..20mA), 2x pulse or relay outputs
- Serial communication option with ENVIS support



**SIMON PQ:** - ultracompact, portable power quality analyser

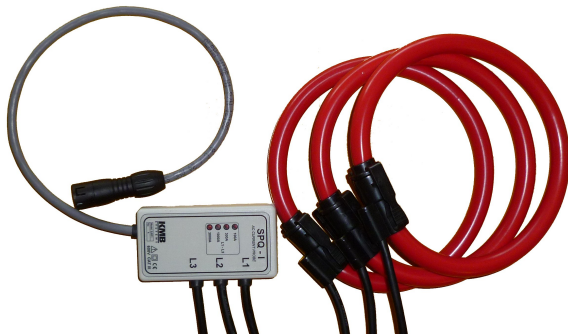
- Measures 4×Voltage and Current continuously, up to 18×Current multiplexed
- Compact and modular design in IP65 enclosures
- Event recording and EN50160 PQ evaluation
- Measures ambient temperature

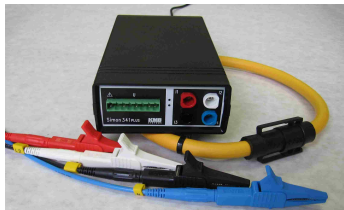
[online docs](#)



- BRAVO:** monitors up to 8 feeders simultaneously (multiplexed)
- continuous  $4 \times U$  and  $4 \times I$ , maximum  $4 \times U$ ,  $32 \times I$
  - functions, parameters & features common with SIMON PQ
  - Monolithic, all-in-one design
  - Internal GPRS modem option - instant remote supervision

## Flexible CT's for SIMON PQ and BRAVO instruments

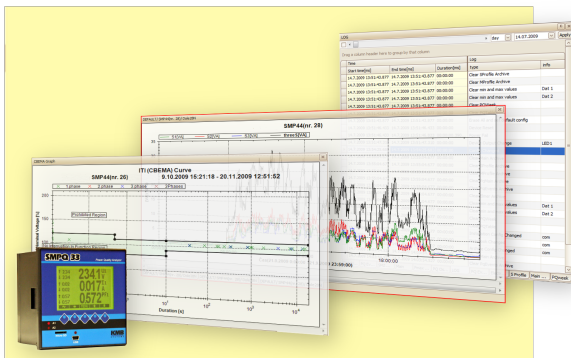




## SIMON 341 PLUS:

[online docs](#)

- Direct replacement of previous SIMON 341 analysers
- New evaluated quantities and larger record memory
- Improved measurement precision and aggregation
- Smaller footprint (enclosure)
- Fast data acquisition over USB, support of ENVIS software



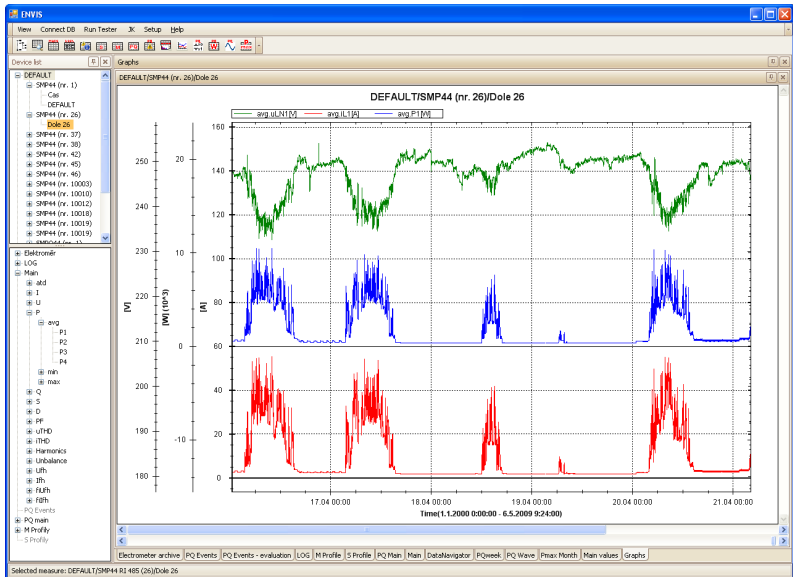
- 1 **ENVIS** software for data visualization and reporting
- 2 **ENVIS.Daq** data acquisition and instrument configuration
- 3 **ENVIS.Online** system service for continuous data retrieval

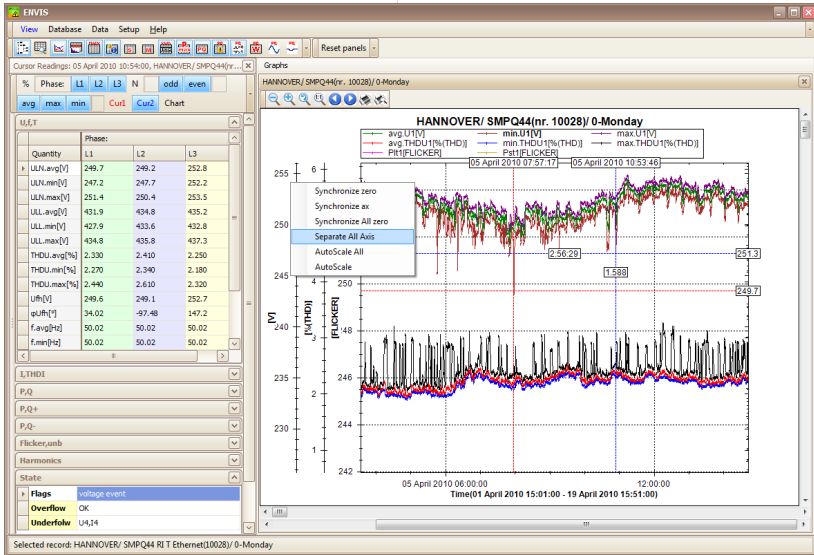


## ENVIS - Main Features

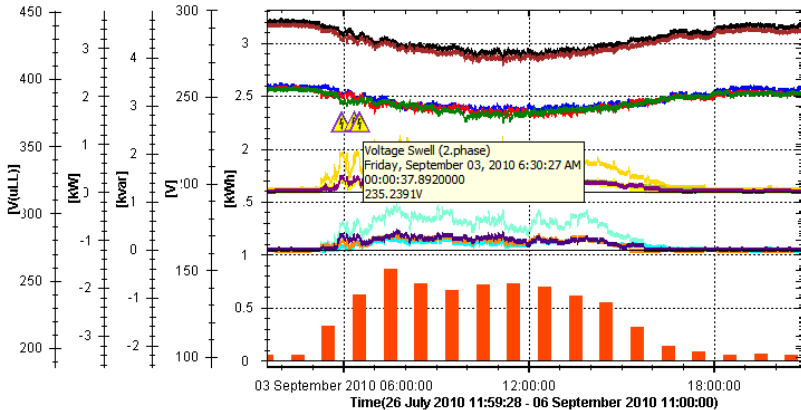
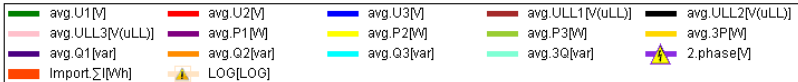
- 1 Works in Windows XP, Vista, 7, Server 2008
- 2 Supports KMB systems instruments
- 3 Supports electricity meters (Moeler, ZPA, NRZ ...)
- 4 Allows remote access to databases with records
- 5 SQL Server or binary files as data storage
- 6 Import and export (XML, XLS, CSV, CEA, PNG, TXT)
- 7 Visualization of all archived records and reporting

[ENVIS resources and downloads on the web](#)





### KMB Office/ SMP44



## Power Quality Evaluation in ENVIS software

- 1 Weekly - intervals according to EN 50160
- 2 Voltage events - sags/dips, swells, power outages
- 3 Half period TRMS value recording
- 4 Oscilloscopic records of events

Power Quality

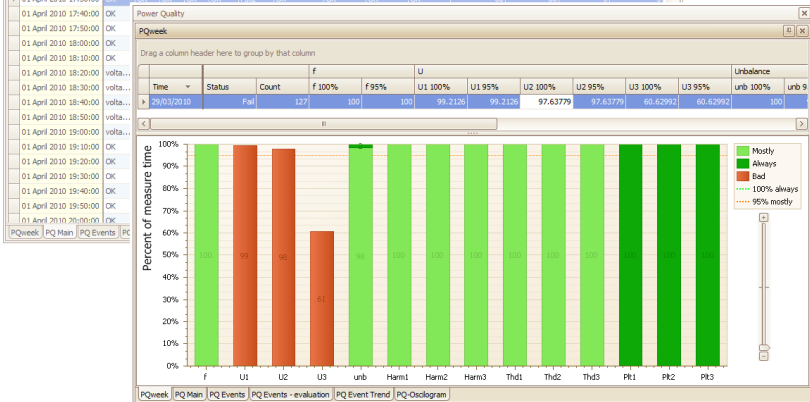
PQ Main

max 01.04.2010 00:00 Apply

Drag a column header here to group by that column

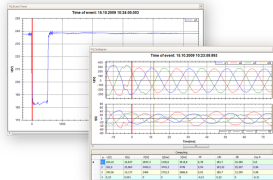
Export

Time	U	Out of limits									frequency				
		flags	U1	U2	U3	THD	flicker	unbalance	HarmU1	HarmU2	HarmU3	f_always	f_usualy	f_below	f_above
01 April 2010 17:00:00	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	60	60	0	0
01 April 2010 17:10:00	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	60	60	0	0
01 April 2010 17:20:00	OK	OK	OK	OK	OK	Pst2	OK	OK	OK	OK	OK	60	60	0	0
01 April 2010 17:30:00	OK	OK	OK	OK	OK	Pst2	OK	OK	OK	OK	OK	60	60	0	0

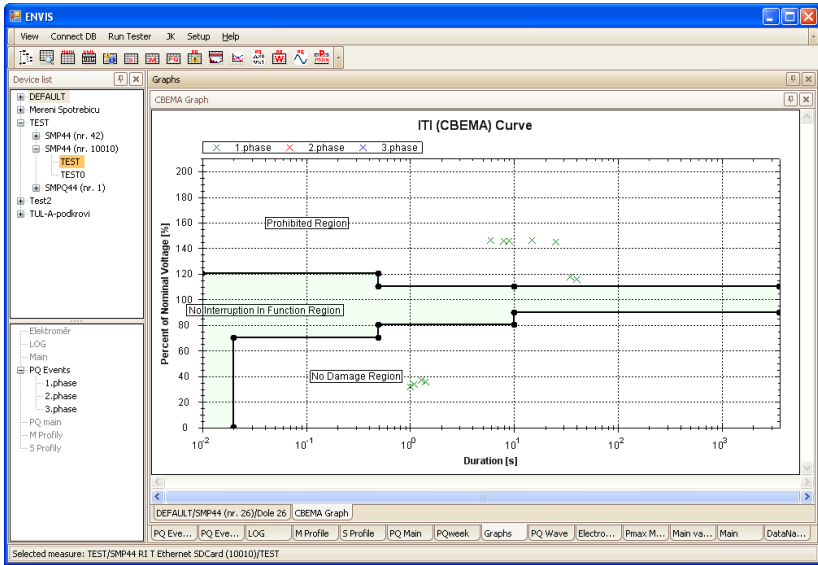


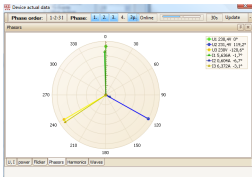
## Voltage Event Evaluation

- Deviation from the reference voltage - nominal, sliding
- Half-period TRMS evaluation
- Each phase is evaluated separately
- Single phase and three phase events
- Events can be triggered by user defined logical function



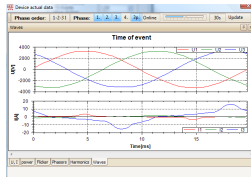






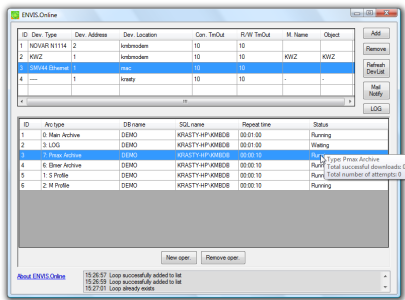
The screenshot shows the 'Archives Downloader' window with a table of data archives. The table has columns for 'Archive', 'Count', and 'Download'. A 'Refresh all' button is highlighted in yellow. Below the table are options for 'Send to: DB' and 'From: last in DB', and a 'File Type' dropdown menu.

Archive	Count	Download
Main Archive	4379	Download
Blow Archive	544	Download
Peak Archive	0	Download
S Profile	0	Download
M Profile	1440	Download
PQ Events	4	Download
PQ Oscillogram	30	Download
PQ Event Trend Archive	Can't read.	Download
LOG	699	Download
Refresh all		Download all



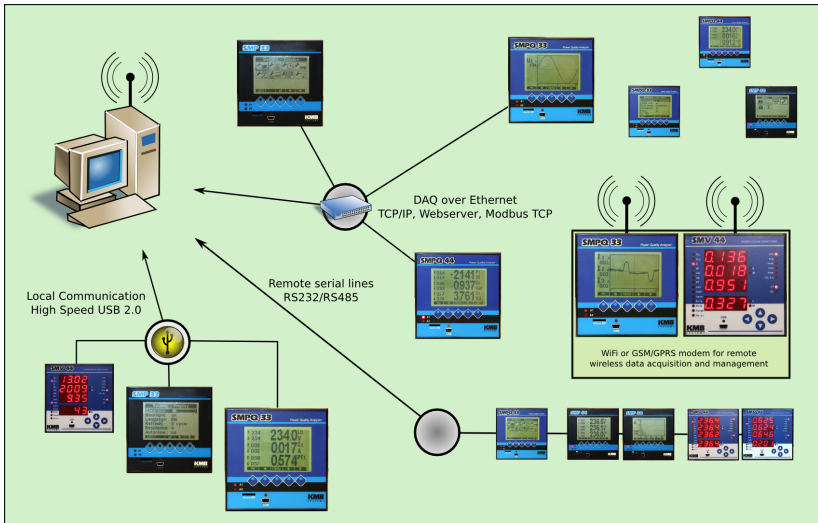
## ENVIS.Daq: Unit Configuration and Data Download

- Supports USB, RS232/RS485, Ethernet, GPRS, Wireless
- Comfortable configuration of supported instruments
- Archivation of recorded data
- Instrument lookup and localization function



## ENVIS.Online: System Service for Automated Data Acquisition

- Periodic actualization of record database
- Online reading recording for instruments without memory
- State monitoring, recording, alarms (EMAIL,SNMP,SMS)
- Client application for easy configuration and supervision





For more information visit us [online at www.kmb.cz](http://www.kmb.cz).  
Feedback and questions send to [support@kmb.cz](mailto:support@kmb.cz)