

Mobile demand analysis in three-phase systems

CAM mobile

Demand analysis in any low-voltage system with data recording

The CAM mobile has been designed for mobile analysis in low-voltage power distributions. It provides the following functions to the user:

- Analysis of the present system state for monitoring and maintenance purposes
- Detection of disturbances such as voltage variations or voltage sags
- Demand analysis of power distribution, generators or transformers
- Tracing billing relevant quantities such as load curve or peak demand
- Collecting total active and reactive energy demand in all four quadrants

For the parameterization of the device before measurement and the subsequent analysis of the recorded data PC knowledge is required. The installation in the field can be performed quickly and easily because all required accessories are in the scope of delivery.

By using Rogowski coils for current measurement a wide application field in power distributions of 30 up to 3000 A may be covered without hardware variance. Thus the ideal device for energy providers, electricians or installers.



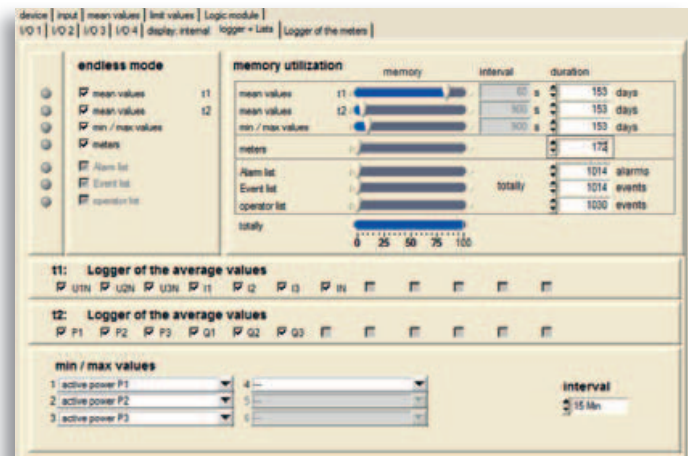
CAM mobile complete with accessories, software and operating instructions in a stable hard-shell suitcase

System analysis in 3 steps

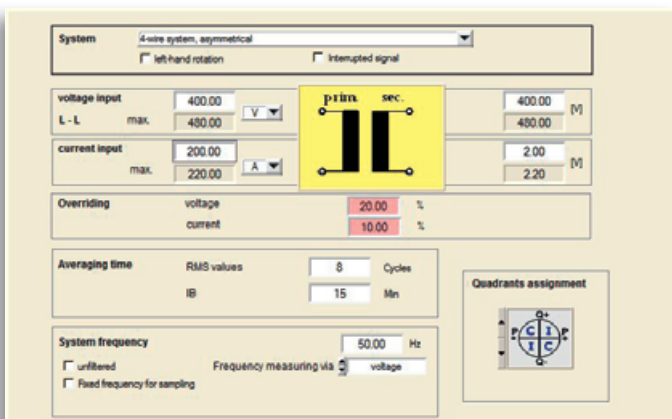
Preparation of measurement

By means of the CB-Manager software the CAM mobile can be prepared for the measurement task using the USB interface. It may be optimally adapted to the requirements on-site:

- Measurement input: Type of system to monitor, rated values of current and voltage inputs
- Selection of mean values and min/max quantities for long term recordings
- Defining events (limit values) to be monitored for the event lists
- Fixing memory utilization for data loggers and lists
- Parameterizing the display for customized measurement displays
- Setting time reference (time and date)



Settings of the data logger



Parameterization of measurement inputs

These settings may be archived to be able to perform easy parameter modifications on-site.

Logger and lists may be individually started and stopped. These states remain stored during transport to the measurement site.

Performing the measurement

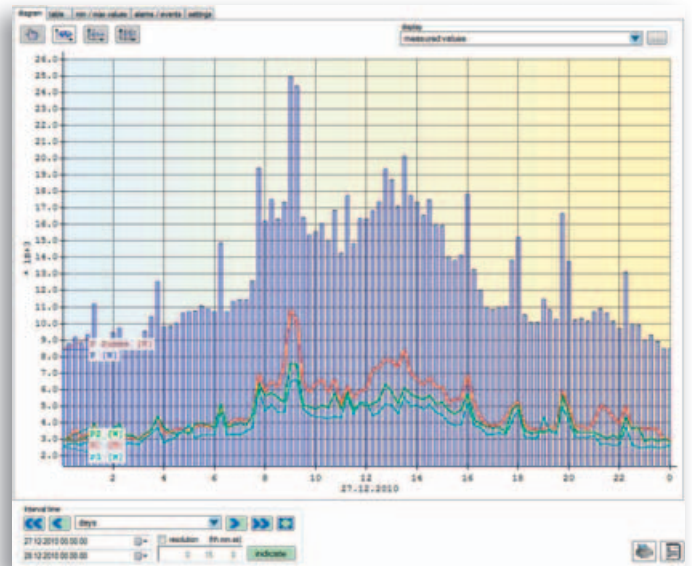
Once the CAM *mobile* has been connected on site, the measurement can be easily started by switching on the device.

The correct wiring of the device can be checked using the wiring control via display. An extended analysis is provided as well using the CB-Manager software.

Analysis of recorded data

After measurement the analysis of the recorded data can be performed via CB-Analyzer software. To do so, the values of the data logger will be copied into a database. The analysis is then performed using the data base only, without the need to have the device connected.

Analysis can be performed either graphically or in tabular form. Data may be exported as well as an Excel, PDF or Word file.



Analysis of a daily load curve

date	local time	LS	Text
19.01.2011	10:09:00.3	2	Mean current > 190A
19.01.2011	10:11:00.3	2	Mean current < 180A
19.01.2011	10:59:00.2	2	Mean current > 190A
19.01.2011	11:01:00.3	2	Mean current < 180A
19.01.2011	12:00:00.2	3	
19.01.2011	12:30:00.2	3	
19.01.2011	15:05:00.3	2	
19.01.2011	15:08:00.2	2	
19.01.2011	16:30:00.2	3	
20.01.2011	07:55:00.2	2	
20.01.2011	07:59:00.3	2	
20.01.2011	08:00:00.2	3	
20.01.2011	08:52:00.3	2	
20.01.2011	08:53:00.3	3	Mean current < 180A

Once the system load is known, peak loads may be reduced by suitable load management. To optimize costs and to avoid penalties a balanced load of the individual phases as well as an optimization of the load factor may be suitable additional goals.

By determining the minimum and maximum values within the individual billing intervals also the protection by fusing of the individual circuits as well as the short-term load of means of production may be examined and modified if necessary.

Alarm list with export facility

Technical data

Rated voltage	57.7 ... 400 V _{LN} , 100 ... 693 V _{LL}
Current ranges	30 / 300 / 3000 A
Measurement interval	Programmable, 1 ... 1024 cycles (averaging, RMS values)
Power supply	AC, 50 – 400 Hz, 100 ... 230 V ± 15%
Systems	Single phase, split phase, 3- / 4-wire balanced or unbalanced load
Safety EN 61010-1	300 V~ CAT III; 600 V~ CAT II (Protection class I, Connection to protective earth of the fixed installation)
Accuracy (without Rogowski coils)	0.1% (V, I), 0.2% (P, Q, S), ± 0.01 Hz (f), 0.5% (THD-V, TDD-I, unbalance V), Active energy class 1, reactive energy class 2
Time reference	Internal clock, ± 2 minutes / month (15 up to 30°C)
Event monitoring	64 limit values, 32 functions with 3 logic inputs each
Mechanic	Aluminum desktop enclosure with plastic handles Dimensions: 294 x 185.2 x 74.2 mm Protection: IP40 (housing), IP20 (connectors)

The alternative permanent installation

The CAM *mobile* bases on the **SINEAX CAM**, a proven universal measurement unit for heavy-current quantities, equipped with Rogowski current inputs.

The disadvantage of previous fixed installations with Rogowski current measurement was that the integrators of the coils needed batteries, which required a permanent maintenance. This has been fixed by providing the required power supply via CAM, no matter if a 3 V, 4.5 V, 6 V or 9 V supply is needed.

So, using the SINEAX CAM now you can use the advantages of Rogowski coils, especially the fast measurement of current changes and the exact harmonic analysis, also for permanent installations. The CAM with Rogowski current inputs is mainly used in melting processes, test facilities and power distributions.



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