

# GEOPHYSICS



**ES&S**  
INSTRUMENTS & SOFTWARE

DISTRIBUTOR



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## APPLICATIONS



- Subsoil groundwater prospecting at shallow, medium and great depth
- Geological stratigraphy
- Studies of salt water contamination in fresh water layers
- Landslide monitoring
- Mineral exploration (sulphides, etc.)
- Archaeological research

## AVAILABLE MODELS



### 16GL

Reliable and portable, the 16GL system is characterized by really first-rate performances at extremely low cost. The possibility to carry out the download through RS-232 permits a fast processing when using the SEV inversion software.

## METHODS



There are different electrical methods that may be used when carrying out vertical electrical soundings (V.E.S.), all substantially based on the energization of the ground by means of the input of a current by two electrodes (A and B) and the voltage measurement between two other electrodes (M and N), which have a different position compared to A and B. Measuring the voltage between M and N you'll obtain the apparent resistivity value of the ground: in general, it is possible to operate on an always bigger target area, by increasing the distance between the current electrodes progressively, and, therefore, have always more information on the depth. From this it is possible to reconstruct a curve of apparent resistivity variation with depth, which can be interpreted by means of the relative data inversion software (see also the section concerned).

The current introduced in the ground is a continuous current which is periodically "commutated" in such a way to result under the form of a square wave: this makes it possible to limit troublesome phenomenons like the "polarisation of electrodes" in M and N, a real "battery-effect" which can make the voltage measurement of these electrodes impossible.

A complete geo-electrical instrument consists generally in a measuring system and a data display/storage system, a direct current source (one or more rechargeable P-100 accumulators, or a P-300 energizer), cables, electrodes (of stainless steel, copper or microporous porcelain), a data inversion software.

GEO-010-000



GEO-004-000



GEO-010-000



GEO-004-000



GEO-005-000



GEO-005-000



GEO-005-000



GEO-005-000



**MAIN FUNCTIONS**



- High resolution (16 bit, floating point)
- High sensitivity (lowest voltage measured: 600nV)
- Instrument managed by multiprocessor
- Continuous readout of current/voltage
- Autoranging (automatical adapting of the instrument range to the signal value to measure)
- Acquisition memory of 1500 readings without direct data downloading
- Easy menu for quick learning
- Creation of energetic wave based upon the parameters supplied by the user
- Data transfer through RS232
- More than 40 hours of autonomy
- Automatic filtering
- Notch filters 50/60Hz
- Reduction of noise with stacking and average of the values acquired
- Automatic calibration at every switch-on
- Suitable to any type of energizer (max.600V, 0,5A)
- Light and compact structure in a sturdy weatherproof case

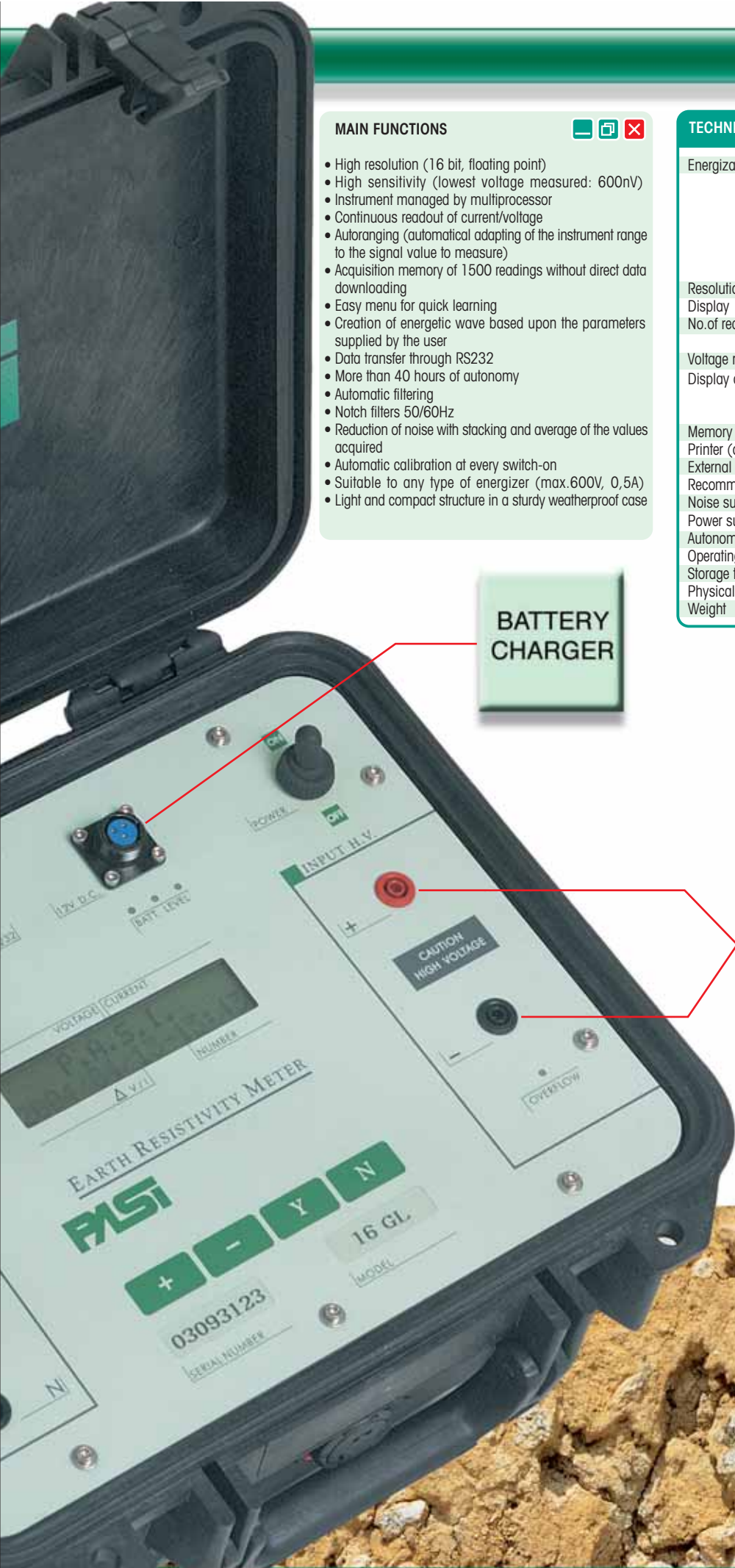
**TECHNICAL FEATURES**



Energization curve	may be customized by the following parameters: positive and negative wave length: 0,1 – 9,9 sec (impl. at 25 sec.) time between positive and negative wave: 0,1 – 9,9 sec intercycle time: 1 – 99 sec no of cycles: 1 – 99
Resolution	610 nV, 126,8nA
Display	16 x 2 characters, background lighting
No. of readout per wave	3 readouts of voltage and 3 readouts of current, consecutively and at wave term
Voltage range for VMN	from +/-20mV to +/-1280 V (automatically selected)
Display of measures	datum and time sequence number V, I and VI (already mediated)
Memory	up to 1500 measures
Printer (optional)	DPU-414 SEIKO
External data ports	RS-232, printer
Recommended energizer	600V (1200V peak-peak), 0,5A max
Noise suppression	superior to 98 db at 50-60 Hz
Power supply	2x internal rechargeable battery 6V - 4A/h
Autonomy	more than 50 h, with low battery alarm indicated on display
Operating temperature	0 ± 60°C
Storage temperature	-20°C ± +80°C
Physical dimensions	38 x 27 x 15 cm (shock proof case)
Weight	7 kg

**BATTERY CHARGER**

**GEO-035-000**



## AVAILABLE MODELS



P100-1/2/3  
P300 / P300T

## RECHARGEABLE ACCUMULATOR FOR V.E.S. P-100



A valid and ecological alternative to disposable 90V batteries, P-100 represents a renewable energy source for the realization of vertical electrical soundings. It will be possible to carry out a series connection up to a voltage delivery of maximum 1000V.

P-100 is compatible with all P.A.S.I. earth resistivity meters and is delivered in a practical transport case with handle.

## TECHNICAL FEATURES P100



Output	P100-1: 100 V – 1000 mA max, adjustable P100-2: 200V – 500mA max, adjustable P100-3: 300V – 300mA max, adjustable
Power supply	External battery charger, 220V
Dimensions	24x18x11 cm
Weight	2,5 kg

## ENERGIZERS P-300 / P-300T



A practical and compact alternative to 90V batteries, P-300 is capable to deliver the correct quantity of current for every need in a totally controlled way.

It is available in two versions: when used with conventional systems for vertical electrical soundings, P-300 (standard version) provides for the optimal energization of the ground, allowing the maximum energy saving; when used with the 16G instruments for electrical imaging (P-300T version), the working voltage and the current to be delivered are on the contrary controlled and read directly by the earth resistivity meter (in a condition of galvanic isolation both towards the battery and the electrodes) in function to the current being set and the conditions of the ground.

## TECHNICAL FEATURES P300/P300T



Input voltage	12 V +/- 20%
Output voltage	0-300 V +/-5%, with automatic limitation of the output power
Power supply	6Ah rechargeable internal battery; external battery (polarity reversal protection)
Output current	0-450 mA +/-10%, with automatic current overcharge
Efficiency	75-80%
Internal battery supply	5000 cycles at 100% of power 10000 cycles at 50% of power
Operating frequency	50 kHz
Type of insulation	of galvanic type between battery and energizing electrodes
Voltage and current indications	by LED on panel
Battery control	state of charge indication on panel
Current programming	by potentiometer
Safety devices	polarity reversal protection in case of power supply from external battery
Operating temperature	from -10 to +60 °C
Storage temperature	from -20 to +80 °C
Dimensions	33x30x15 cm
Weight	7 kg



MODELLI DISPONIBILI

P100-1/2/3  
P300 / P300T

V.E.S. 2000



This software package, available for compatible PC IBM systems and implemented in Windows® environment, has been conceived for the inversion, on data processing basis, of vertical electric soundings realized with the most currently used spreading types. Its main functions are among others the following:

- field data input (with printing possibilities)
- numerical input of layer thickness and resistivity
- display of related theoretical curve in superimposition to the field data
- automatical identification of the succession of layers and related theoretical curve without the need to entry any parameter whatsoever and with the possibility to select the number of layers required
- display of layers, in bilogarithmic scale, on the same graph as that for the theoretical curve and that for the field data.
- possibility to modify the layers resistivity or thickness directly on the graph, immediately showing the consequent variations of the theoretical curve (thus no need to digit numeric values).
- determination of the Equivalent Models (at the end of the operation a window will display the percentage shifting between the calculated and the field curve)
- possibility to directly enter the description of the probable lithotypes on the screen as they are identified during the inversion
- possibility to modify the step of the decade being employed for the identification of the theoretical curve
- printing of the table related to the layers (with the possible description of lithotypes) as well as the bilogarithmic graph representing the field data points, the theoretical curve and the layers representation (optional)
- possibility to customize header and print-outs
- possibility to edit data

The minimum hardware requirements are the following:

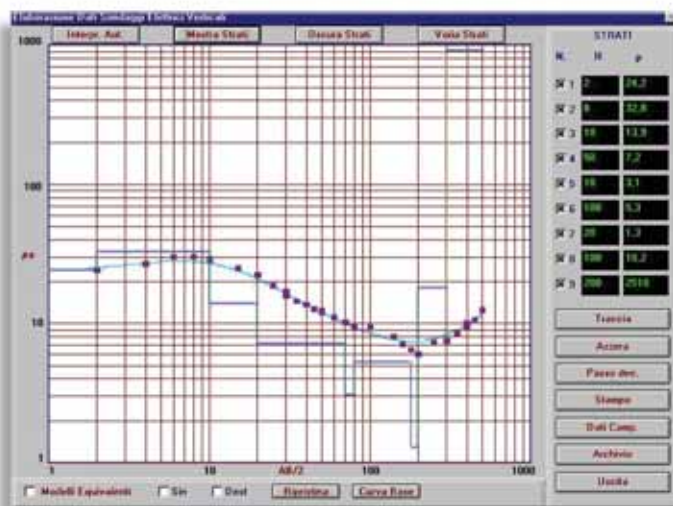


- IBM processing unit or compatible with 80386SX processor or better
- Microsoft Windows 3.1 operating system or following versions
- 4 MB RAM
- 2MB of free space on hard disk
- VGA graphics card or better (the program will automatically adapt to the resolution being set in Windows®)
- one 3,5" floppy disk
- graphic printer with a specific driver for Windows®

Data input



Data inversion



Electro-stratigraphy printout



V.E.S. 2000



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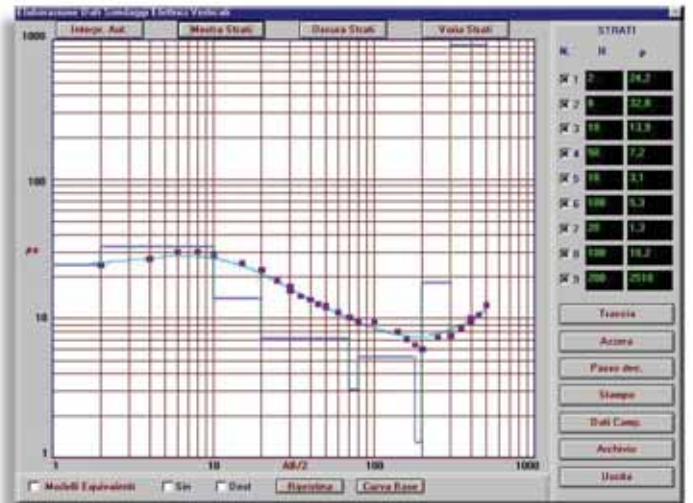


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