EAGE EUROPEAN ASSOCIATION OF GEOSCIENTISTS & ENGINEERS Copenhagen 2012.

Cluster of Applied Earth Sciences

CAPES

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Karotázs MEASUREMENT & INNOVATION

Scientific Technical and Trade Ltd.

Services

KAROTÁZS Scientific-Technical-Trade Ltd. was established in 1995. by former employers of MÉV (Mecsek Ore Mining) Company. In the previous years the staff experienced in underground exploration, using mostly self developed tools. Our field of activity is mainly well-logging, drilling geophysics and well testing.

Our services:

Well-logging for well construction, condition assessments, dynamic well testing

Borehole logging for mineralogical purpose, geological prospecting, environmental protection measurements

Research and development

During the 15 years, KAROTÁZS Ltd. has achieved an important position in the practice of Hungarian borehole, and well-logging metrology. For maintaining a high niveau in our work, we operate quality operating system, improve our equipments supplied by own and external resources. Beside the daily routine work, we managed to accomplish several competitions successfully, and we have developed new measuring equipments and techniques. R&D activity is a still running program in the life of our Ltd.

Impedance Measurement

In our presently R&D project we are developing a 1 – 256 channelled, DSP based group of electrical impedance measurement system for applications in geophysics, inquiry of materials and living structures.

PC programmable properties of finished equipments:

optional current or voltage generator, current or voltage measurement

detection with digital lock-in amplifier in all channels

setup of measuring system: modular, measuring with 8 - 256 channels

measuring range: 1 Ohm – 100 Mohm, 0 – 90 degree

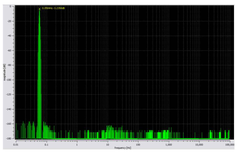
system accuracy better then 0,01 %, +/-0,01 degree

frequency range of measuring signal: 0,01 Hz – 90 kHz

outgoing current range: 1 mA – 1000 mA

outgoing voltage range: 1 mV – 100 V

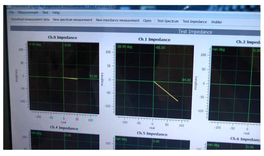
Demonstration of the Impedance Measurement System



The potential applications of the system: FFT spectrum measurement, impedance measurement (EIT), impedance spectrum measurement (EIS). With the measurement system it is possible to measure in two points with multiple frequencies or at a constant frequency in many points.

Possible applications:

FFT spectrum measurement for the analysis of nonlinearity and intermodulation of environmental noise or measured material



electrical impedance tomography (EIT): non-invasive 2D, 3D, 4D imaging technique, which is used for technical engineering in several occurrences

electrical impedance spectroscopy (EIS): non-invasive spectroscopy technique, that provides the possibility for measurement sample and/or process characterization by recording the impedance spectrum

with using lock-in technique and modification of input channels, the system is able to be used for acoustic and magnetic impedance measurement

NPCLOG Surface Unit

Our NPCLOG equipment is a universal PC-based surface recording unit, which (contrary to earlier practice) was constructed using exclusively own developments like task oriented motherboard, boards for measuring, data acquisition.

"Office" installed in our well-logging truck

Temperature range: 0-50°C

Power supply: = 12 V, ~230 V

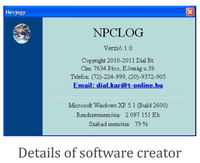
Communication with PC: USB2

Required cable: Armored mining cable, with 4 conductors

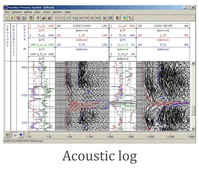
Maximum cable length: 2500 m

The NPCLOG surface recording unit

The measuring and processing software is also self-created.

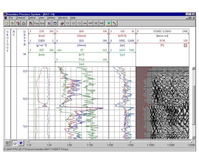


Details of software creator



Acoustic log

Well testing in extreme circumstances

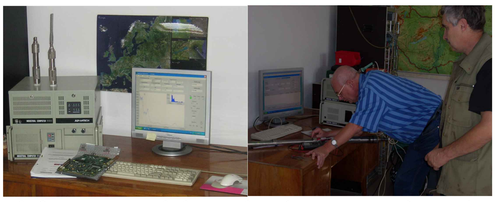


Logging results

The NPCLOG is able to function with amuplex, acoustic and resistivity probes, and impedance measuring unit.

GSP Measuring System

A product of our R&D activity is a well-logging system suitable for energy selective detection of gamma-radiation. The system is applicable for natural and neutron activated inquiries. With our product, it is possible to measure K, U, Th isotop concentrations and it is able be to used for minerological purposes (with activation measurements). Due to the wide temperature range, application of automatic spectrum stabilization is necessary.



Surface measuring unit built in an industrial computer case and testing the measuring probe

GSP probe:

Temperature range: 0-80 °C,

Max. pressure: 200 MPa,

Power supply: 35-58 V/100 mA,

Communication: RS-485

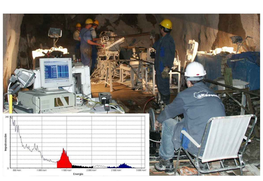
Detector: BGO, NaI scintillator R980-1 (Hamamatsu) PMT

Measured channels: 256/512/1024

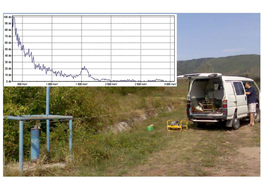
ADC resolution: 12 bit,

Surface unit: NPCLOG, with notebook

Experimental gamma-spectrum measurement



Measurement of gamma-spectrum in Eastern adit of underground repository



Experimental gamma-spectrum measurement in a monitoring well

The developed measuring technology and process (with some modification) is able to be used for gamma-spectrum measurements in other cases as well.