The Volterra

A low cost, pocket size, resistivity device for siting boreholes

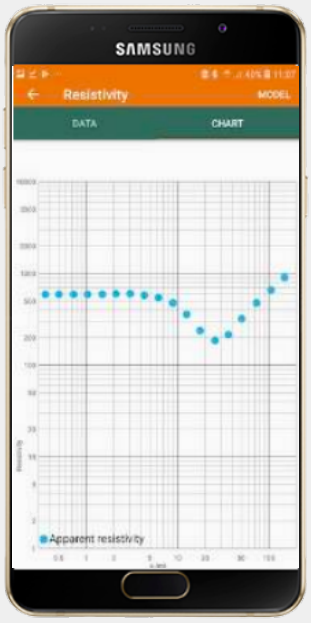
Over the past 5 years, PRACTICA has developed a simplified device to match the current single point siting equipment. The result is the smartphone-operated VOLTERRA, which is a fraction of the cost of traditional VES equipment such as an ABEM Terrameter, yet gives identical results. The device has been validated through lithology and depth proofing in Mauretania, Mali, Chad, Mozambique, Madagascar and Liberia.



The Volterra measures ground resistance and can perform Vertical Electrical Soundings (VES) or Horizontal Electrical Profiling (HEP). The 10 watt, 600 Volts device is controlled through a smartphone app via Bluetooth. A complete measurement can be defined including method (Wenner or Schlumberger) and an array of electrode spacings. After submission of data, the user receives an email with a pdf report and excel file, which includes both the raw data and modelling results. Functionality includes fully automated measurement, including background removal, stacking, and filtering. Power level and waveform duration can be set automatically or manually.

Siting is an integral part in water point construction. It provides information on the choice of the drilling method, the likely cost, the expected drilling depth and the lithology a driller may encounter. Community consultation often leaves a number of sites to choose from. Geophysical siting is then an essential next step to avoid failed boreholes, and can mean the difference between a productive and a dry borehole. For machine drillers, a dry borehole is often a risk that is borne by the driller, while for manual drillers, the unexpected occurrence of hard rock means re-siting and incurring substantial cost for mobilization and labour. Small companies often lack the financial resources to cover such costs.

Siting can increase the efficiency of water programs, especially when it is used to plan a batch of boreholes and a selection on the most promising areas is required. Traditional Vertical Electrical Sounding (VES) equipment is expensive (€10.000 - 30.000) and is sparsely available in low-income countries. The equipment has hardly changed in the last 50 years, with paper record keeping and computer analyses still part of today's VES measurements. Together with the high level of required skills, these are barriers for a larger group of users who could really benefit from VES during siting.



The portable size makes it easy to carry to the field or on the plane, especially as it connects to an external 12V car or motorcycle battery. Data capture (raw and calculated) is made visual in a graph and together with smart measuring, the device helps to minimize errors.

As the sharing of data is made accessible and its use is simplified, it brings geophysics into the reach of a much broader audience such as drillers and NGOs in both the development and humanitarian sector. With support from geo-hydrologists in the interpretation of the data, rapid assessments can become a significant cost and time saver.

Interested? Please contact us at:
info@practica.org

Practica also sells full siting kits that can be used with the Volterra device. Interested? Please, contact us.

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