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LandMapper® ERM-01

Throw away your augers and soil samplers! Well, not quite. LandMapper ERM-01 is here to help you delineate areas with contrasting soil properties within the fields quickly, non-destructively, and cost-efficiently. Using the device prior to soil sampling you can significantly reduce the amount of samples required and precisely design a sampling plan based on the site spatial variability.

LandMapper measures electrical resistivity or conductivity of soils and related media for express non-destructive mapping and monitoring of agricultural fields as well as construction and remediation sites. In a typical setting, a four-electrode probe is placed on the soil surface and an electrical resistivity value is read from the digital display. The device measures electrical resistivity in a surface soil layer of the depth from 2 cm down to 5 m, which is set by varying the size of a four-electrode probe.

Key Features

Compact and **portable** design (weights only 250 g without the probe)
Fast (one measurement takes 5 sec.)
Accurate (automatically accounts for spontaneous potential arising from grounding of the electrodes)
Safe and **economical** (uses a standard 9 V battery)
Seamless connection with personal computer for data transfer (stores 999 data values)
Modular and **interchangeable** the 4-electrode probes and detachable measuring unit
Versatile (the same unit can be used in field mapping and

Equipment measures potential difference ($\Delta\varphi$), which arises between two electrodes (M and N), when electrical current (*I*) is applied to two other electrodes (A and B) as in well-known in geophysics four-electrode principle. Device than calculates electrical resistivity from the voltage/current measurements and supplied geometrical coefficient. Direct output from the LandMapper ERM-01 is electrical resistivity in Ohm m, which is easily converted into electrical conductivity (S m^{-1}) by data post-processing. Advanced scientific research supports versatile applicability and usefulness of our equipment. Our team was working on a theory of the electrical fields in soils, applications of electrical resistivity measurements in soil science, and electrical geophysical data interpretation for 20 years; combined work of three Ph.D. scientists in the area is about 38 years. Five dissertations and 2 books were published on the topic in Russia and USA.

Technical Specifications

- Range of measurement……0,1-1M Ohm m
- Automatically switches electrical resistivity ranges. Precision and error of measurements:

Range, Ohm	Precision	Relative error, max
0.1 - 1	0.01	4%
1 – 10	0.01	2%
10 – 100	0.1	2%
100 – 999	0.1	0.1-1%
1,000 – 5,000	0	0.1-1%
5,000 – 9,999	0	2.5%
10,000 – 25,000	100	2.5%
25,000 – 100,000	100	4.5%

- User-defined K (geometrical coefficient)……...0.1 up to 99.9
- Quantity of changeable K-coefficients..……...10
- Quantity of data storage locations……..……999
- Range of operation temperatures……..from - 10 up to + 40 C^0 or 14 to 100 F
- Air humidity no more than……65 %
- Weight of the device no more…….. 250 g or 8 oz
- Current of consumption no more……..7.0 mA
- Output voltage, no more……5 V
- Measurements comparable with DC methods, frequency…..……1.25 Hz
- Computer connection…….serial port

Applications of the equipment

- Mapping of soil surface electrical resistivity or conductivity, which is shown to be related with soil texture, salinity, stone content, pollution by oil products, etc.
- Measuring electrical resistivity in soil pits to better diagnose genetic horizons.
- Possibility to monitor electrical resistivity distribution in soil profiles without excavation to study freezing-melting, drying-wetting, and solute redistribution processes.
- Measuring electrical resistivity in soil columns in model experiments to account for spatial variability and to outline solute flow.
- Measuring electrical resistivity of liquids, solid, and semisolid media, such as soil samples, pastes, and slurries; wood; food; and others.