

ADS-IP

User Manual



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OPERATIONS PROCEDURE

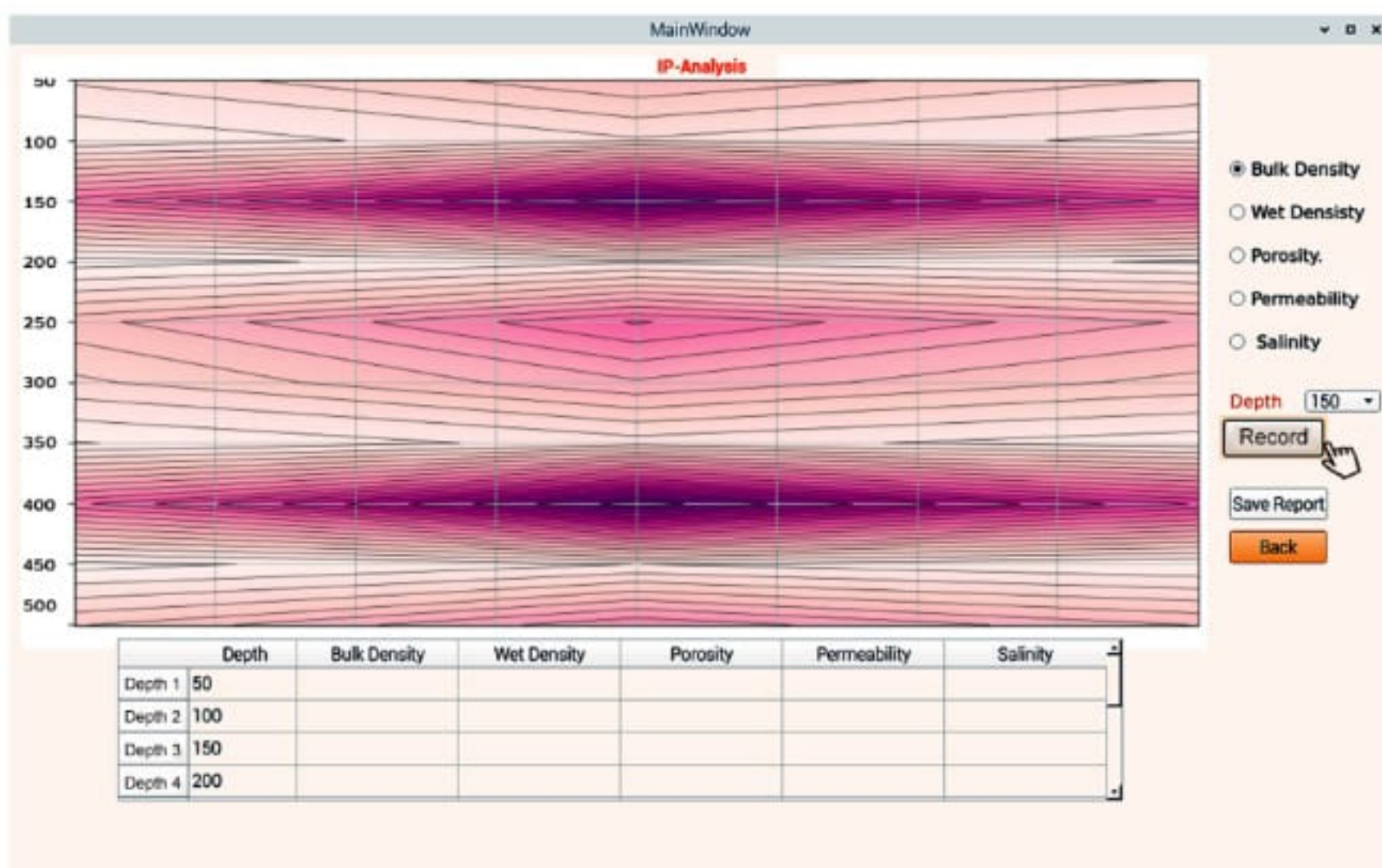
The report is generated by detailing the complete characterization features

Bulk Density, wet density, porosity, permeability and salinity factors.

BULK DENSITY

The bulk density of a rock is $B = WG/VB$, where WG is the weight of grains (sedimentary rocks) or crystals (igneous and metamorphic rocks) and natural cements, if any, and VB is the total volume of the grains or crystals plus the void (pore) space.

Bulk density is obtained by dividing the dry mass of soil by its total volume. The bulk density formula or bulk density equation is: $\rho = m/v$, where m refers to the mass of the dry soil and v refers to the volume of the dry soil. ρ is the bulk density of dry soil.

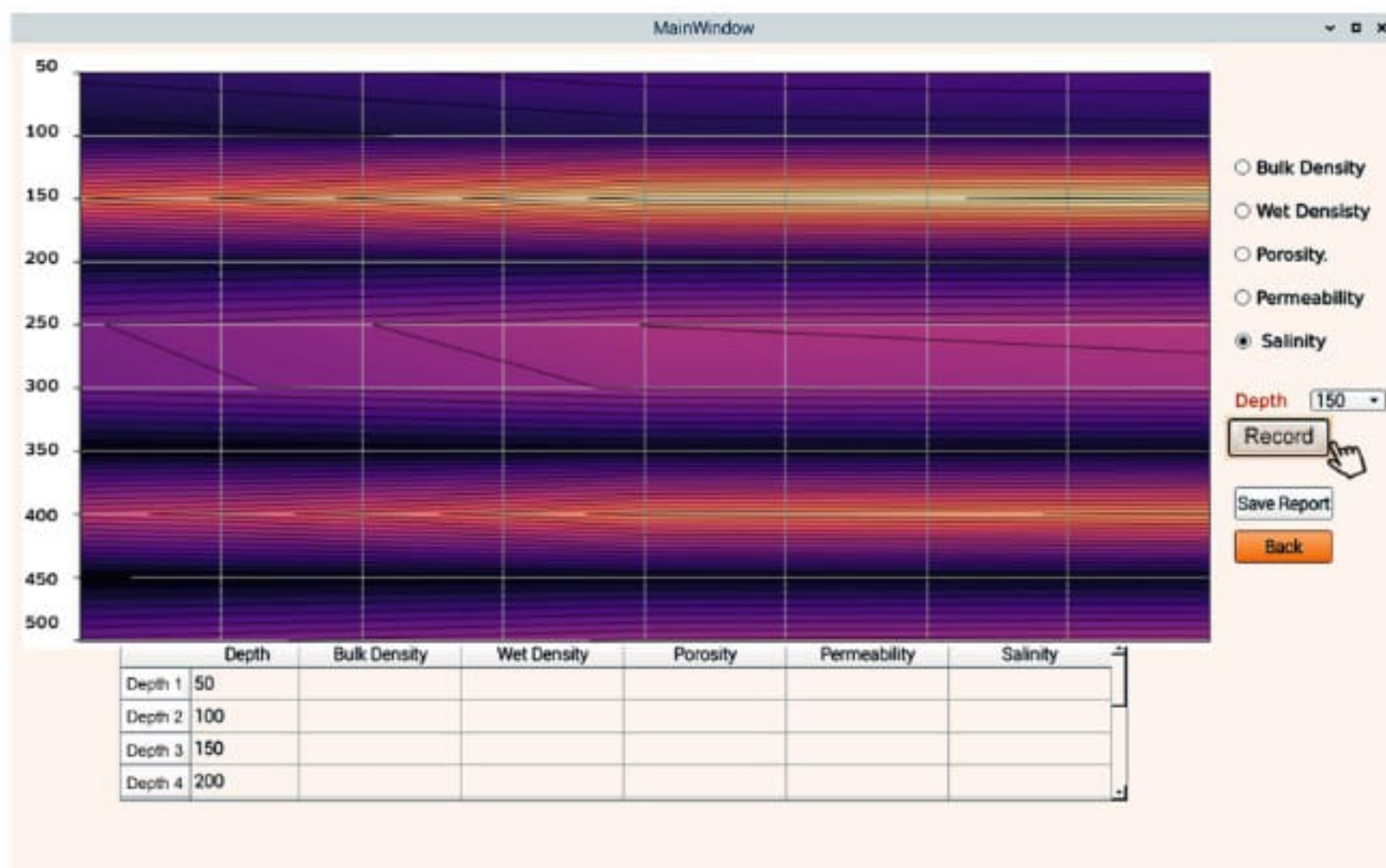


SALINITY

The term "Salinity" refers to the concentrations of salts in water or soils. Salinity can take three forms, classified by their causes: primary salinity (also called natural salinity); secondary salinity (also called dryland salinity), and tertiary salinity (also called irrigation salinity).

Salinity occurs when the water table rises, bringing natural salts to the surface; in sufficient quantity, these salts become toxic to most plants.

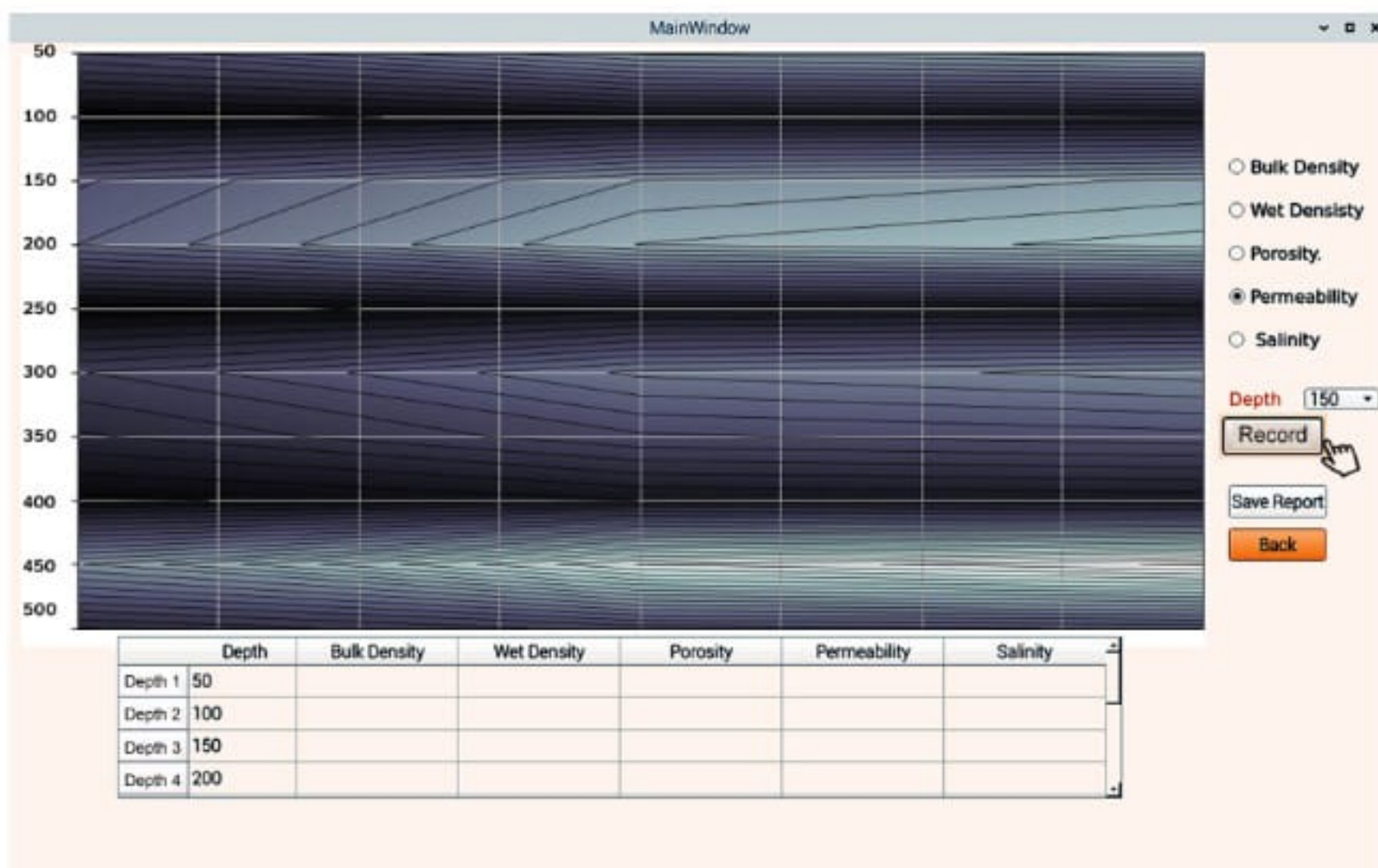
The electrical conductivity or EC of a soil or water sample is influenced by the concentration and composition of dissolved salts.



PERMEABILITY

Mathematically, it is the open space in a rock divided by the total rock volume (solid and space). Permeability is a measure of the ease of flow of a fluid through a porous solid. A rock may be extremely porous, but if the pores are not connected, it will have no permeability.

There are 3 types of permeability: effective, absolute, and relative permeabilities. Effective permeability is the ability of fluids to pass through pores of rocks or membranes in the presence of other fluids in the medium.



ADS-IP (ADVANCED DETECTION SYSTEM)

The ADS system is derived from the Induced polarization technique, where the capacitance of the sample is measured by the received frequency constants in numerical and decimals as comprised by the data recording software, where a frequency is injected and the dissolving time of the frequency by the medium is measured in the time domain constant to denote its actual value for further references.



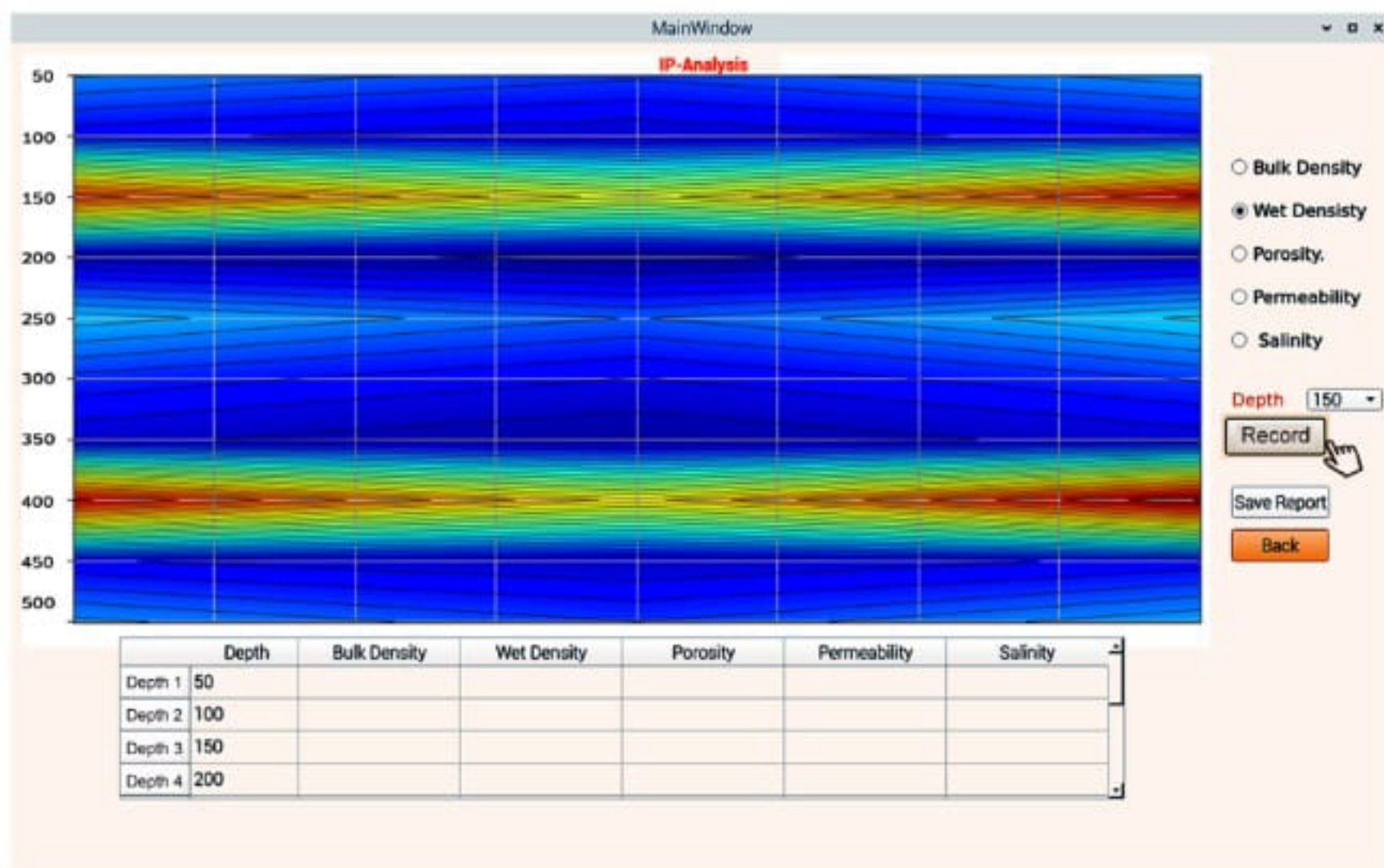
IP surveying is an exploration method involving the measurement of the slow decay of voltage in the ground following the cessation of an excitation current pulse (the time domain method), the technology usually uses a huge set up of hardware's and high voltage current to conduct deeper depth survey protocols.

In order to complete the survey by the latest embedded electronics and advanced data capture software, The Max development team accelerated in switching the voltage requirement to frequency pulse and started to calculate the frequency domain, in controlled frequency band , where the capacitance of frequency is measured and denoted as digital data for interpretation.

WET DENSITY

The density of the sediment is determined by its composition. In a sediment core variations in density down a core indicate fluctuations in sediment composition suggesting more than one sediment source.

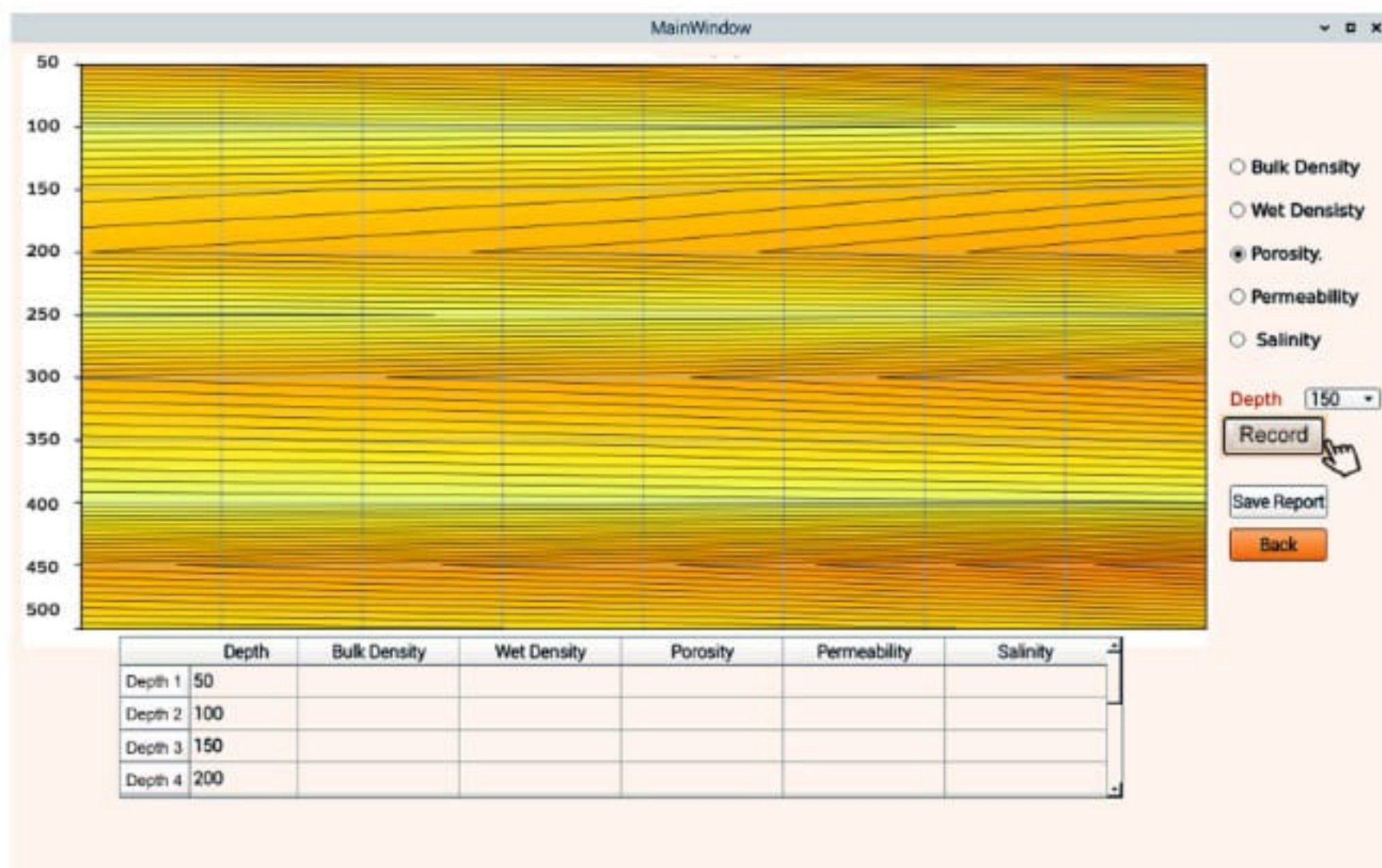
When there is moisture content in the soil, the wet bulk density is obtained by dividing the mass of solids plus the mass of water by the total volume.



POROSITY

Porosity is the percentage of void space in a rock. It is defined as the ratio of the volume of the voids or pore space divided by the total volume. It is written as either a decimal fraction between 0 and 1 or as a percentage.

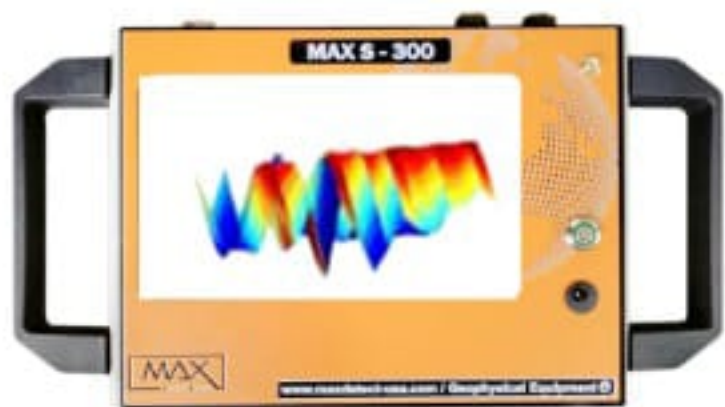
In between the particles are spaces that are filled with gas, air or liquid. Particles' shapes and sizes affect how they aggregate, including how tightly they can pack together, which affects a rock's porosity—a property that is the ratio of the volume of a rock's empty spaces to its total volume.



ADS Parameters

ADS-IP	Advanced detection system (Induced polarization)
Depth selections	150m/300m/500m/750m/1000m/1250m
Frequency	As per depth selection
interpretation	2D profile
Main terminal	64 Bit processing
Analysis	Lithological characterization
Recorded data	Numerical and decimals
Reports	.Pdf
IP Switch	4 Node
Channel	4 channel
Data transfer	IP Switch to main terminal
Screen sharing	Desktop PC, Laptop PC, Tablet PC

Host terminal



IP Switch



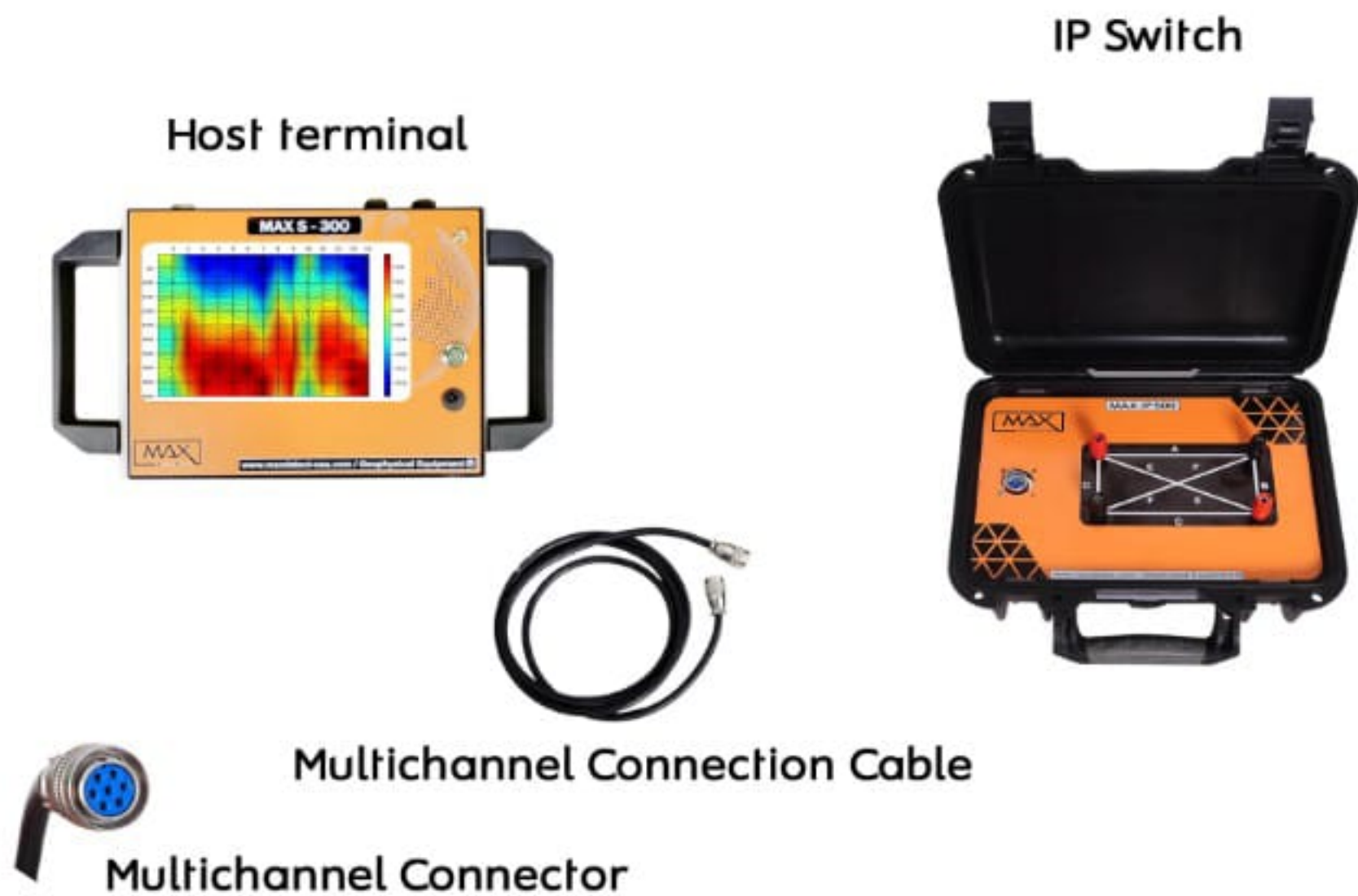
Multichannel Connection Cable



Multichannel Connector

OPERATIONS PROCEDURE

Connect the data transfer cable from the main terminal to the IP switch for communication.



In the main terminal select ADS (IP) software to start the survey.



OPERATIONS PROCEDURE

Select the required depth to be monitored.

The screenshot shows the 'IP-Analysis' software window. On the right side, there are five radio buttons for selecting a parameter: Bulk Density, Wet Density, Porosity, Permeability, and Salinity. Below these is a 'Depth' dropdown menu currently set to '150'. A mouse cursor is clicking on a button (likely 'Record') below the dropdown. Below the dropdown are three buttons: 'Save Report', 'Back', and a highlighted 'Record' button. At the bottom, there is a table with columns: Depth, Bulk Density, Wet Density, Porosity, Permeability, and Salinity. The table has four rows labeled 'Depth 1' through 'Depth 4' with values 50, 100, 150, and 200 respectively.

	Depth	Bulk Density	Wet Density	Porosity	Permeability	Salinity
Depth 1	50					
Depth 2	100					
Depth 3	150					
Depth 4	200					

Start the survey by clicking record and wait for the task to completely process and record data's from all the four channels.

This screenshot is identical to the previous one, showing the 'IP-Analysis' software window. The 'Record' button is now highlighted with a mouse cursor, indicating it has been clicked. The other elements, including the radio buttons, dropdown menu, and table, remain the same.

	Depth	Bulk Density	Wet Density	Porosity	Permeability	Salinity
Depth 1	50					
Depth 2	100					
Depth 3	150					
Depth 4	200					