

IP-L SYSTEM CORE AND SAMPLE RESISTIVITY /IP TESTING SYSTEM



Introduction

IP-L systems has been designed to measure resistivity and IP parameters on rock samples or drill hole cores. The knowledge of such physical parameters is useful both to check the ability of EM, DC resistivity or IP surveys in detecting a given target, and to improve the quantitative interpretation of ground geophysical data.

IP-L system consists of three units:

- A sample holder frame
- IP-L low power time domain transmitter
- ELREC or any time domain IP receiver



Sample Holder Frame

Rock samples have first to be cut in a parallelepipedic shape (thickness: 15mm) with diamond saw. Then, they have to be fixed in a 30mm diameter plastic ring (thickness: 15mm) with an araldite resin warmed in a vacuum oven at 60°C.

After they have been prepared, samples have to be placed into a water filled container during several days so that water can fill the pores of the rock.

By connecting the AB terminals of the IP-L transmitter to the external plugs of the sample holder frame and the MN terminals of the ELREC receiver to the internal plugs, all the current supplied by the transmitter will flow across the rock sample as long as the resin is non porous.



IP-L TRANSMITTER

To obtain both Resistivity and IP measurements on rock samples or drill hole samples, the next steps have to be followed:

- Connect the AB output plug of the IP-L Transmitter to the external plug of the sample holder
- Select the pulse duration (1 or 2 seconds)
- Select the intensity of the regulated current (1,10 or 100 µA)
- Use the IP receiver to carry out the measurement (voltage and chargeability)

ELREC RECEIVER

To obtain Resistivity/IP Measurements, you can use either the ELREC 6 or ELREC Pro Receiver.

For induced Polarization parameters, sample chargeability values can be read directly on the display of the receiver.

For resistivity measurements, the following computations have to be carried out:

Let L, l, e be the three dimensions of the sample (e= thickness = 15mm), Vp the voltage by the receiver, I the intensity of current provided by the transmitter, and RHO the resistivity of the rock

The resistance of the rock sample is:
 $R = RHO \cdot e / L \cdot l = VP / I$

Hence:

$$RHO = (Vp/I) (L \cdot l / e)$$

L, l, e	in m
VP	in mV
I	in mA
RHO	in ohm.m

For example:

L = 16mm l = 18mm e = 15mm
 Vp = 2311 mV I = 0.01 mA RHO = 4440 ohm.m



SPECIFICATIONS

Sample Holder Specifications

- Dimensions: 12 x 24 x 16 cm (5 x 9 x 6 in)
- Weight: 1.5 kg (3 lb)

IP-L Transmitter Specifications:

- Maximum output voltage: 10V
- Symmetrical time domain waveform (ON+,OFF, ON-,OFF)
- Pulse duration: 1s or 2s
- Output current: 1, 10 or 100 μ A
- Current regulation \pm 1%
- Power supply: four 1.5V, A size dry cells
- Operating temperature range: 0°C to +70°C
- Dimensions: 16 x 22 x 10 cm (6 x 9 x 4 in)
- Weight: 0.5 kg (1 lb)

ELREC Pro Receiver Specifications *

- Input voltage: Max. for channel 1: 15 V
Max. for the sum from channel 2 to channel 10: 15 V
- Protection: up to 800V
- Voltage measurement: Accuracy: 0.2 % typical
Resolution: 1 μ V
- Chargeability measurement: Accuracy: 0.6 % typical
- Induced Polarization (chargeability) measured over to 20 automatic or user defined windows
- Input impedance: 100 M Ω
- Signal waveform: Time domain (ON+,OFF,ON-,OFF) with a pulse duration of 500 ms - 1 s - 2 s - 4 s - 8 s
- Automatic synchronization and re-synchronization process on primary voltage signals
- Computation of apparent resistivity, average chargeability and standard deviation
- Noise reduction: automatic stacking number in relation with a given standard deviation value
- SP compensation through automatic linear drift correction
- 50 to 60Hz power line rejection
- Battery test

* You can get more information on our ELREC IP Receivers on the following links:

[Elrec6.pdf](#) , [Elrec_pro.pdf](#)

