

IRIS INSTRUMENTS

ELREC T

VERSATILE RESISTIVITY AND IP SYSTEM

- Transmitter-Receiver
- Two-dipole Receiver unit

ELREC T has been designed as a versatile Resistivity and Time Domain Induced Polarization System:

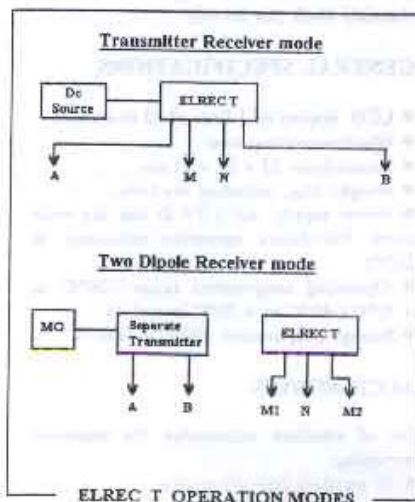
- in its Transmitter-Receiver mode, ELREC T includes all the functions and specifications of the well-known SYSCAL R2 resistivitymeter: powered by an external DC source, ELREC T can deliver up to 800V voltage, with a current which can reach 2.4A.
- in its Two-dipole Receiver mode, ELREC T includes all the functions and specifications of the ELREC 2 receiver, and can be used with any more powerful separate transmitter (VIP3000 ...) generating a standard Time Domain IP waveform.

In both modes, ELREC T features the following benefits:

- Automatic measurement
- Digital stacking for signal enhancement, with computation of standard deviation
- Computation of apparent resistivity for most electrode configurations (Schlumberger, Wenner, Gradient, dipole-dipole, ...)
- Computation of apparent chargeability, with up to 4 preset or programmable IP windows
- Internal memory for data storage, for up to 1000 readings
- Serial link for data transfer to computer for plotting and interpretation

YOUR REASONS FOR CHOOSING ELREC T WHEN YOU CARRY OUT BOTH MEDIUM DEPTH AND DEEP INVESTIGATION SURVEYS.

- For medium depth investigations, ELREC T will be a powerful and compact resistivitymeter with up to 800V output voltage.
- For deep investigation, ELREC T will be a two dipole receiver, while a separate transmitter (VIP3000 ...) will transmit the current whenever more power or a greater voltage is required.



$V = 6.31 \text{ mV}$	$I = 28.0 \text{ mA}$
$q = 1 \%$	$\#5$
$RHO = 81.4 \text{ Ohm.m}$	
$Q = 0 \%$ $M = 6.0 \text{ mV/V}$	
$M1 = 11.2$	$M2 = 8.8$
$M3 = 6.4$	$M4 = 4.4$

ELREC T DISPLAYS



MEASURED PARAMETERS

- Measurement and display of current, voltage, standard deviation, SP.
- Computation and display of apparent resistivity for main electrode arrays: Schlumberger, Wenner, Gradient, dipole-dipole.
- Measurement and display of IP chargeability with four windows. Delay time and windows widths individually programmable (in the transmitter-receiver mode only).
- Display of noise level before measurement.
- Measurement and display of ground resistance (electrode check).

MEMORY OPERATIONS

- Storage of data in the internal memory (up to 1 022 readings). Each reading includes current, voltage, SP, resistivity, chargeability, spacings, station number, etc.
- Reading of data stored in the memory on the LCD display.
- Transfer of data to a computer (ASCII, binary files) through RS-232 serial link.
- Direct transfer of data to a printer.
- Remote control of the unit by a computer, through the serial link.

TRANSMITTER SPECIFICATIONS

- Maximum output voltage: 800V (1600V peak-to-peak).
- Maximum output current: 2.4A
- Output current specifications:
Resolution: 10µA
Accuracy: standard 0.3% (max. 1% from -20°C to +70°C)
- Output current waveform:
Frequency domain ON+, ON- for resistivity.
Time domain ON+, OFF, ON-, OFF for resistivity and chargeability

- Pulse duration (ON time) programmable from 0.25 to 10s, with preset values of 0.5s, 1s and 2s.

- Thermal circuit breaker for overheating protection.

DC POWER SOURCE

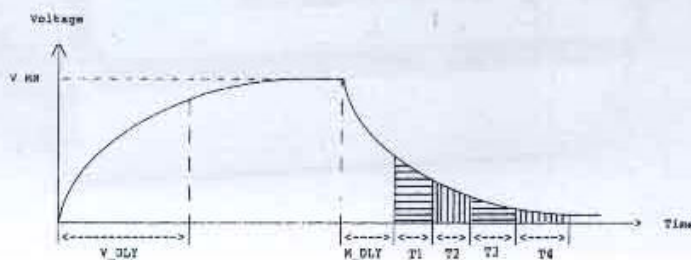
The external DC source for ground energization can be:

- 125W DC/DC converter (400V, 4kg) with 12V battery
- 250W DC/DC converter (800V, 5kg) with 12V battery
- 1200W AC/DC converter (800V, 25kg) with 220V (or 110V) motor generator

RECEIVER SPECIFICATIONS

- Input impedance: 10 Mohms
- Input overvoltage protection
- Input voltage range: -5V to +5V
- Automatic SP bucking (-5V to +5V) with linear drift correction (up to 1 mV/s)
- 50Hz and 60Hz power line rejection
- Ground resistance measurements from 0.1 to 1 000 KΩ
- Voltage measurement specifications:
Resolution: 1µV after stacking
Accuracy: standard 0.3% (max. 1% from -20°C to +70°C)
- Chargeability measurement specifications:
Resolution: 0.1 mV/V
Accuracy: 1% of displayed value for a voltage greater than 10mV
- Continuous digital stacking up to 250 stacks

TIME DOMAIN IP CHARGEABILITY



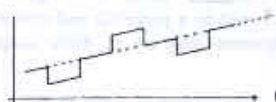
CURRENT TRANSMISSION

RELAXATION

$$M_i = \int_{T_i} [v(t)/VMN] (du/T_i)$$

$$M = \frac{1}{4} \sum M_i / (ST_i)$$

Partial chargeability
Average chargeability



SP compensation



Digital ranging

$$\frac{\text{SIGNAL}}{\text{NOISE}} = \sqrt{N}$$

Digital stacking

$$\left(\sum (M - M_i)^2 / N \right)^{1/2}$$

Standard deviation

INDUCED POLARIZATION MEASUREMENTS

In addition to apparent resistivity, ELREC T also measures the apparent chargeability (Time Domain IP parameter).

For a pulse current waveform (ON+, OFF, ON-, OFF), ELREC T analyses the IP delay curve with up to four chargeability windows.

The average value (M) of the four partial chargeabilities (Mi) is computed and displayed during measurement, while the four Mi values are available after the measurement.

The chargeability values normalized with respect to a standard decay curve can be displayed for the detection of EM coupling or noise effects.

