

IRIS INSTRUMENTS

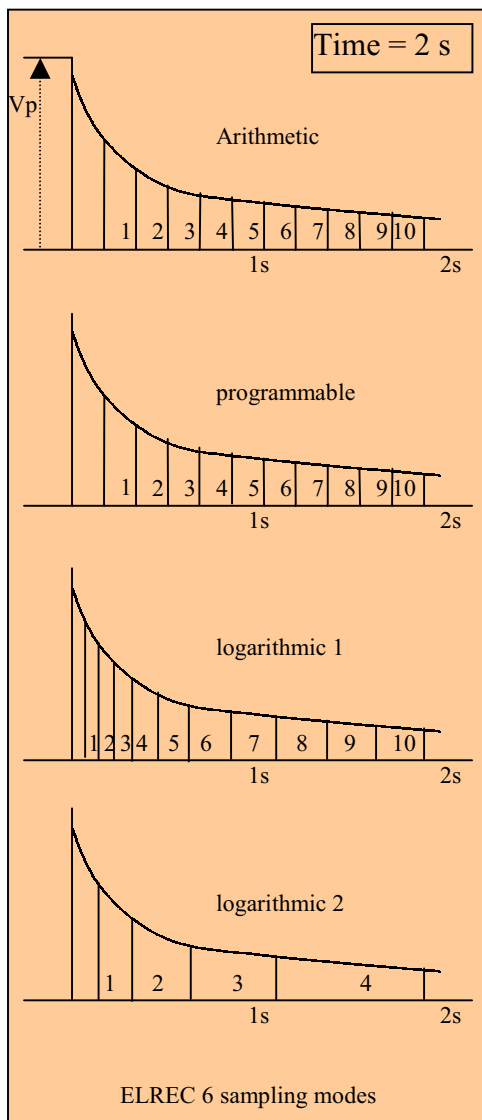
ELREC 6

MULTI CHANNEL

IP RECEIVER FOR

MINERAL EXPLORATION

- Six simultaneous dipoles
- Ten programmable chargeability windows
- High accuracy and sensitivity



ELREC 6 is a six dipole Time Domain Induced Polarization receiver designed for high productivity surveys in mineral exploration.

ELREC 6 has been designed for being both a user friendly and a very sensitive IP receiver.

ELREC 6 OUTSTANDING FEATURES:

• Six dipoles:

The six channels of the receiver permit to measure six dipoles simultaneously, which provides a high efficiency in the field.

• Ten programmable windows:

Beside the classical preset logarithmic and arithmetic model, ELREC 6 also offers ten fully independent programmable windows, which the operator can define by himself according to the way he wants to sample the IP decay curve.

• Automatic measuring process:

A microprocessor fully controls the synchronization, the gain ranging, the stacking, and the display of the results including the apparent resistivity.

• Monitoring display:

During the acquisition, the chargeabilities of the six dipoles can be displayed simultaneously on the LCD display for a global visualization of the readings ; the standard deviations of these chargeabilities can also be displayed simultaneously for a real time monitoring of the quality of the on going readings.

• Internal memory:

The memory can store up to 2500 readings, each reading including the full set of parameters characterizing the measurements; the data and time of the reading, given by the Real Time Clock of the instrument, are also stored. A serial link permits to transfer the data to a printer or a micro computer.

• Remote controle:

ELREC 6 can be fully driven by a micro computer through the serial link for remote operation applications.

• Frequency mode:

The frequency effect and the phase shift between the fundamental and the third harmonics can be measured for a Frequency Domain waveform (ON+, ON-), or for a Time Domain waveform (ON+, OFF, ON-, OFF).

• Field proof instrument:

ELREC 6 operates in a wide temperature range and features a fiber-glass case for resisting to field shocks and vibrations.



ELREC 6 MEASURING PROCESS

ELREC 6 measuring process has been optimized to provide the best possible accuracy in real field conditions.

ELREC 6 features:

- **A noise monitoring system:**

A monitor function enables the operator to check the level of noise observed on each dipole before the measurement: the digital voltmeter function displays on the LCD the raw instantaneous value of potential. In particular, it is possible to numerically observe the presence of a pulse square waveform corresponding to a primary voltage signal and showing the operation of a transmitter. This function is also available during the acquisition of a reading.

- **A line check/ground resistance** measurement that permits to check that all seven electrodes are properly connected to the receiver.

- **A low-pass analog filter**, which reduces the effect of higher frequency natural and cultural noises (50-60 Hz).

- **Automatic SP compensation**, including linear drift correction (up to 1mV/s) through a digital filter.

- **Automatic gain ranging**, within a voltage range of $\pm 10V$.

- **Automatic synchronization process:**

ELREC 6 automatically synchronizes with the signal through a waveform recognition process; besides it automatically re-synchronizes at each new pulse to avoid errors due to a possible shift in the period of the transmitted signal.

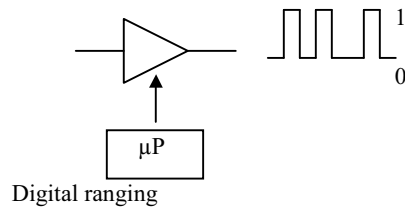
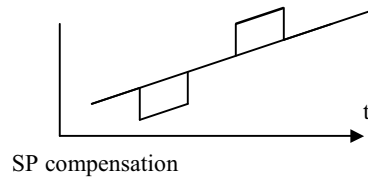
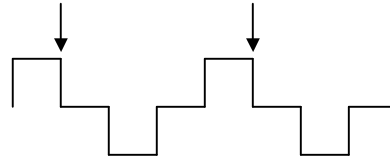
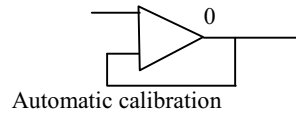
- **Automatic digital stacking** to enhance the signal-to-noise ratio for as long as the operator wants, with a maximum of 250 stacks. During the stackings, the operator can monitor either the instantaneous value (to observe the level of noise), or the cumulative value (to observe the convergence of the average value).

- **A continuous quality test procedure**, which stops the averaging process when the noise level becomes too high, but keeps the previously stacked data. The averaging procedure optimizes the time of data acquisition in very noisy areas.

- **A resolution after stacking** of $1 \mu V$ for primary voltage, and of 0.01 mV/V for chargeability, for pointing out low amplitude anomalies. The standard deviations of the chargeability of the six dipoles are displayed during and after the acquisition to give an indication on the noise level.

- **A Normalized chargeability option:**

The Normalized chargeability option refers the chargeability to a standard IP decay curve, and permits to point out any EM coupling effect on the measured signal.

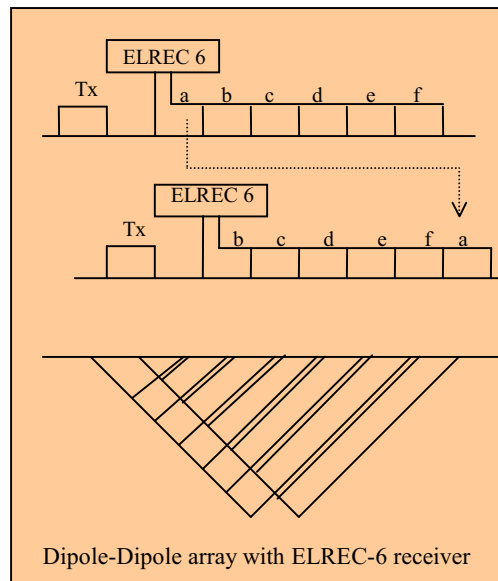


$$\text{Signal / Noise} \sim \sqrt{N}$$

Digital stacking

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

Standard deviation



SPECIFICATIONS:

- Six input channels.
- Signal waveform: Time domain (ON+, OFF, ON-, OFF) with pulse duration of 0.5, 1, 2, 4, 8 seconds.
- Up to ten arithmetic, logarithmic, or fully programmable IP chargeability windows.
- Computation of apparent resistivity, average chargeability and standard deviation.
- Input impedance: 10 Mohms.
- Input overvoltage protection up to 1000 volts.
- Input voltage range: each dipole: 10 V max sum of voltage of dipoles 2 to 6: 15 V max.
- Automatic SP bucking $\pm 10 \text{ V}$ with linear drift correction up to 1 mV/s.
- 20 bits $\Sigma\Delta$ converters.
- 50 to 60 Hz power line rejection.
- Sampling rate: 10 ms.
- Common mode rejection: 100 dB (for RS = 0)
- Grounding resistance measurement from 0.1 to 467 Kohms.
- Battery test: manual and automatic before each measurement.
- Primary voltage: resolution: $1 \mu V$ after stacking accuracy: typ. 0,3 %
- Chargeability: resolution: 0.01 mV/V accuracy: typ 0.6%
- Memory capacity: 2500 readings. R2 232 link for data transfer to micro computers and printers (300 to 19200 bauds rate).
- Remote control through the serial link.

FREQUENCY MODE:

- Signal waveform: (ON+, ON-) or (ON+, OFF, ON-, OFF).
- Pulse duration: 1 s or 2 s.
- Frequency effect and relative phase of fundamental and third harmonics.
- Resolution: about 0.01 degree after stacking.

GENERAL FEATURES:

- Dimensions: 31 x 21 x 21 cm
- Weight: 8 kg with internal battery. (6 kg with dry cells).
- Operating temperature: -40°C to $+70^\circ\text{C}$.
- Power supply: 12 V internal battery, (six 1.5 V D size dry cells, optional). In both cases, a 12 V external battery can also be used.



IRIS Instruments

1 avenue Buffon, B.P. 6007, 45060
Orléans Cedex 2, France
Phone: + 33 (0) 2 38 63 81 00
Fax: + 33 (0) 2 38 63 81 82
E-mail: irisins@attglobal.net
Web site: www.iris-instruments.com