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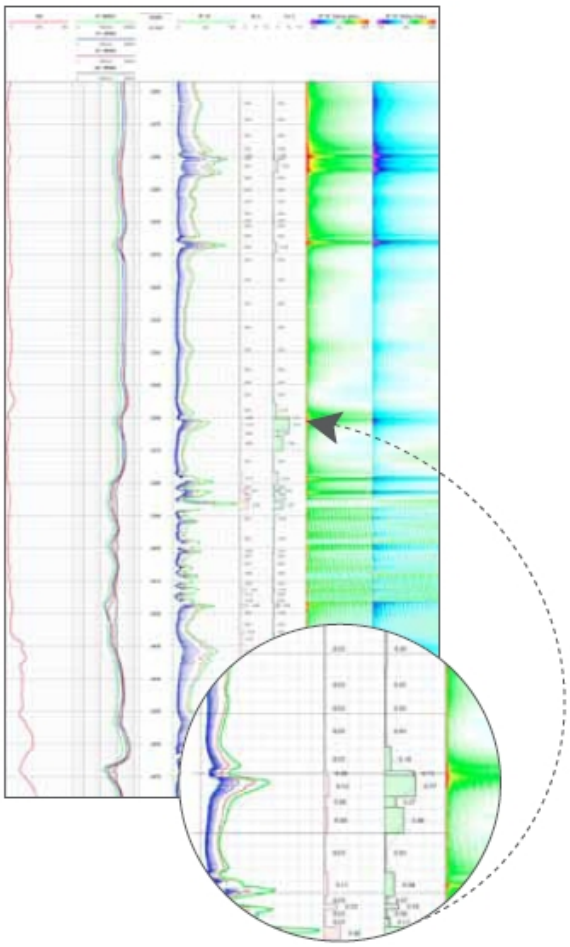
# QL40.IP induced polarization probe

The tool is a combination of a quadruple spacing normal resistivity and dual spacing induced polarization probe measuring the electrical resistivity, self potential and chargeability of rocks. A high chargeability response is an indication of the presence of metallic sulphide and oxides or cation-rich clays. The QL40 IP is an in-line sub. It can be combined with other logging tools of the QL (Quick Link) product line to build tool strings. It can also be operated as a stand alone tool.

- *Real time recording and display of entire current injection and decay cycles (full waveform digitization of electrode voltage and injection current with downhole real time digital processing)*
- *User defined cycle timing (custom 'On' and 'Off' times for IP measurements)*
- *Full measurement range and accuracy is achieved without the need for manual range switching!*



## Application

- Detection of disseminated pyrite in sedimentary rocks
- In uranium roll-front deposits which sometimes show higher concentrations of pyrite
- In coal seams to detect pyrite or other ferrous material
- Detection of sulfides in igneous and metamorphic rocks
- Identify montmorillonite clay in sedimentary depositional systems

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## Principle of measurement

A low frequency alternating square wave current with an 'Off' time between positive and negative parts of the waveform is transmitted from the injection electrode into the formation and returned through the cable armour above the isolation bridle.

The ratio of the secondary voltage measured during the current 'Off' time and the primary voltage measured during 'On' time is related to the electrical polarization of the rock. This chargeability is measured in time domain at the 16" and 64" sense electrodes. Measurements are taken in ten separate time windows during the decay period.

Potential measurements at selected times in the waveform at the sense electrodes are made with reference to a surface electrode ('fish'). The measurements are converted within the probe into apparent formation resistivity and digitally transmitted to the surface unit.

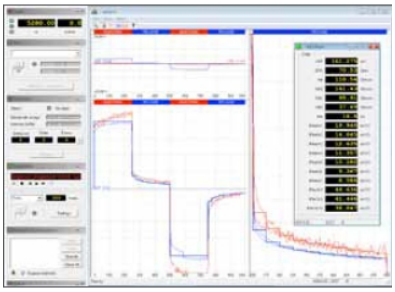
SP voltage and SP Resistance are measured between injection electrode and reference at the surface.

## Measurement/Features

- Chargeability in [ms]
- 2 spacing full wave data
- 8", 16", 32" and 64" Normal Resistivity in [Ohm-m]
- SP in [mV]
- SPR in [Ohm]

## Operating conditions

- Open borehole
- Water filled
- Centralization not necessary
- Runs on multi conductor wireline as well as on mono conductor wireline (with isolation bridle)
- Compatible with Matrix.
- Digital data transmission up to 500 Kbit per second depending on wireline
- Real time automatic telemetry tuning according to the cable length/type



## Technical Specifications

- Diameter : 43mm. (1.7")w/neoprene insulator
- Length : 1.9m (75")
- Weight : 9 kg (19.8 lbs)
- Maximum Temperature: 70°C. (158 °F)
- Maximum Pressure: 200bar (2900psi)

### IP

- Sensor : stainless steel electrode
- Dual Spacing (16" and 64")
- Chargeability measured over 10 time windows per spacing
- Resolution: 1.2 µV
- Input Impedance: 1.4 MOhm
- User defined cycle timing from 100ms – 4000ms (@ 1ms resolution)

### Normal Resistivity & SPR

See QL40 - ELOG specification sheet

*Specifications subject to change without notice*

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