QL40-IP

Induced polarisation probe

17.12.2025

The QL40-IP probe is a combination of a quadruple spacing Normal Resistivity and dual spacing Induced Polarisation probe measuring the electrical resistivity, single point resistance, self potential, chargeability and relaxation time distribution (RTD) of the rocks borehole formation.
A high chargeability response is an indication of the presence of metallic sulphides and oxides or cation-rich clays. When combined with petrophysical analyses, the RTD parameter can be correlated to the mineral grain size distribution and concentration.
The QL40IP 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 standalone tool.

Application

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

Accessories

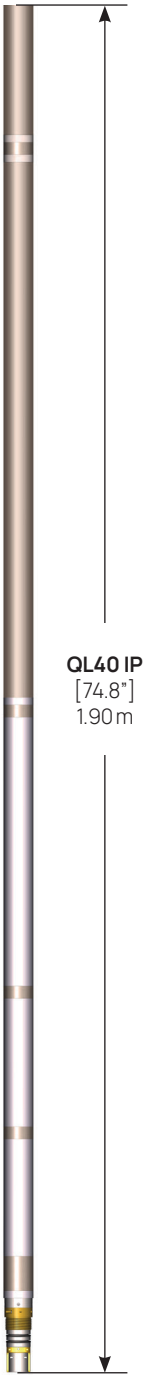
Isolation bridles

QL40-IS1 (MS1 probe top)
QL40-IS2 (GO1 probe top)
QL40-IS4 (GO4 probe top)

Calibration box (P.N. 17 202 096/TB001)

Normal Resistivity
Spontaneous Potential
Induced Polarization

Combined in one box



Tool

Diameter : 43mm (1.7") with neoprene insulator
Length : 1.9m (74.8")
Weight : 9kg (19.8 lbs)
Temp : 0 - 70°C (32 - 158°F)
Max. Pressure : 200bar (2900psi)

IP sensor

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

Operating conditions

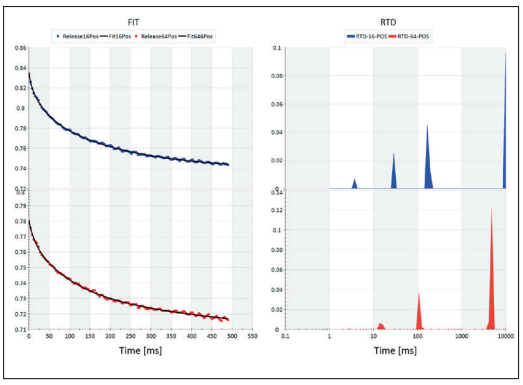
Cable type : Mono, multi-conductor, coax Isolating bridle required
Compatibility : Scout / Opal (ALTlogger / Bbox / Matrix)
Digital data transmission Telemetry : Variable baudrate telemetry according to cable length/type & surface system
Logging speed : depending on IP cycle timing and vertical sampling rate
Centralisation : Not required
Borehole conditions : Fluid-filled boreholes

Principle of measurement

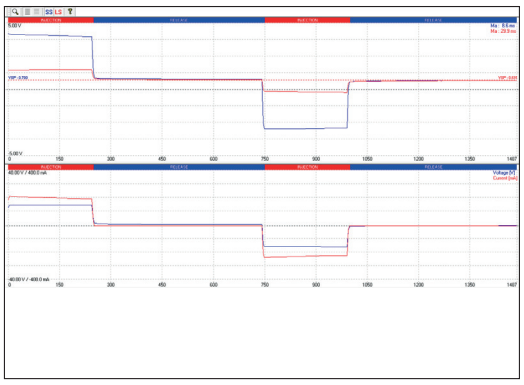
The Induced Polarisation is measured in time mode. An alternating square wave current is injected in the formation and the voltage is measured in parallel. Each measurement consists of a current injection period and a current switch off period which is repeated with opposite polarity. The full waveform of the current and voltage are recorded and displayed. Real time processing of the voltage decay curves yields the IP parameters chargeability and Relaxation Time Distribution (RTD).
In addition, potential measurements at the 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. The Spontaneous Potential (SP) is a record of the natural voltages occuring in a borehole. It is measured between the 64" electrode and armor. The Single Point Resistance (SPR) Point resistivity is measured between the bottom current injection electrode and the isolated cable armor above the bridle. The SPR is a qualitative indication of the electrical resistance of the formation material immediately adjacent to the current electrode.

Measurements features

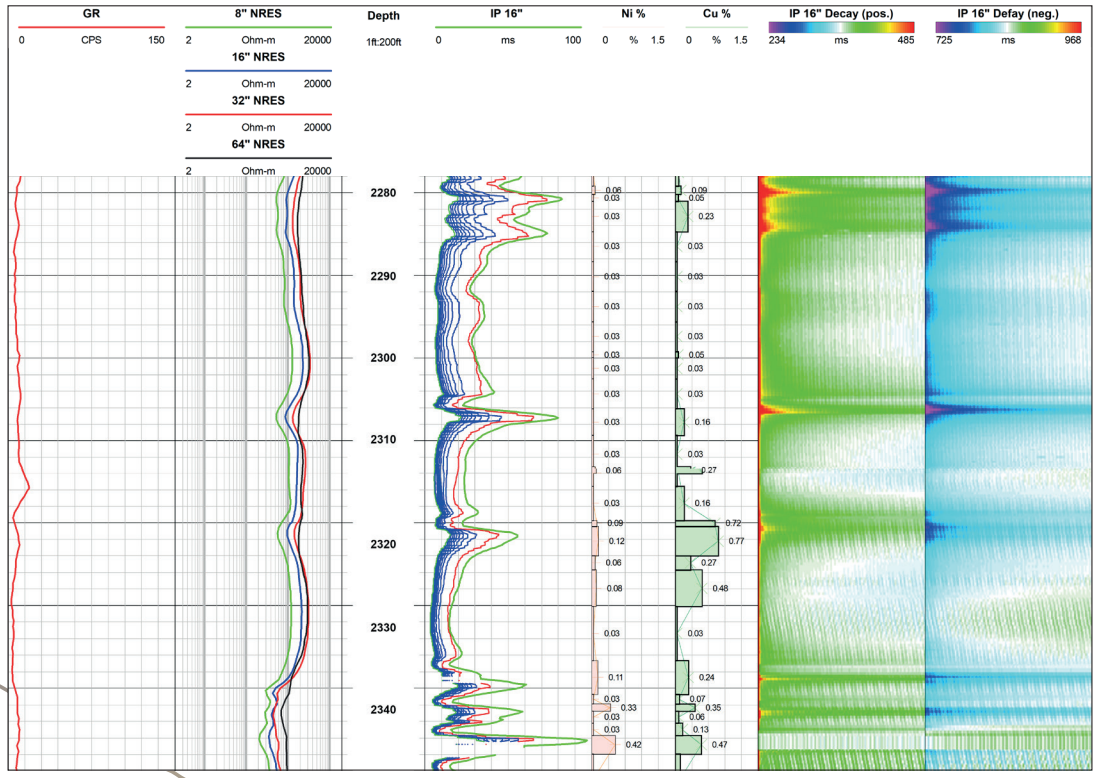
- Chargeability in ms (measured at the 16" and 64" electrodes)
- Relaxation Time Distribution – RTD (measured at the 16" and 64" electrodes)
- Real time processing and display of the entire time series of the current and voltage
- User defined cycle timing (custom « ON » and « OFF » times for IP measurement)
- Normal resistivity in Ohm.m (measured at the 8", 16", 32" and 64" electrodes)
- Single Point Resistance in Ohm
- Spontaneous Potential in mV



IP inversion-RTD browser



IPwave browser



WellCAD software