### QL Stackable Logging Tools

The Quick Link (QL) series of slim-hole logging tools can be combined in custom configurations to acquire more data in a single logging pass.

Each QL tool can be used as a stand-alone probe or combined into a “string” or “stack” to yield multiple measurement parameters simultaneously.

This innovative flexibility saves time in field acquisition and allows for purchases to suit budgets and projects, as needed.

### Examples of QL Logging Tool Applications in Mining, Water, Engineering and Energy

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**IMAGING TOOLS**

**QL40 ABI**
- Acoustic Televiewer
- Sensor: Ultrasonic Transducer
- Temperature - Pressure: 0-70°C (32-158°F), 200 bar (2900 psi)
- Borehole diameter: 0.05 – 0.50 m (2– 20"")
- Diameter - Length: 40 mm (1.6") - 1.6 m (63")
- Weight: 6.7 kg (14 lbs)
- Measurements/Features: 
  - 360° orientated acoustic image (amplitude & travel time)
  - Borehole azimuth and tilt
  - Tool internal temperature
  - Relative bearing
  - Magnetic field
  - Gravity

**QL40 OBI**
- Optical Televiewer
- Sensor: 1/3” high sensitivity CMOS digital image sensor
- Temperature - Pressure: 0-70°C (32-158°F), 200 bar (2900 psi)
- Borehole diameter: 0.05-0.53 m (2”-21”)
- Diameter - Length: 40 mm (1.6") - 1.47 m (57.9")
- Weight: 5.3 kg (11.7 lbs)
- Measurements/Features: 
  - 360° RGB true color oriented image
  - Borehole azimuth and tilt
  - Relative bearing
  - 3 accelerometer calibrated components
  - 3 magnetometer calibrated components
  - Temperature of CMOS image sensor

**SONIC TOOL**

**QL40 FWS**
- Full Waveform Sonic
- Sensor: Ceramic piezoelectric
- Temperature - Pressure: 0-70°C (32-158°F), 200 bar (2900 psi)
- Diameter - Length: 50 mm (2")
- Weight: 18 kg (39.7 lbs)
- Measurements/Features: 
  - Full waveform per receiver
  - Real time p-wave velocity or slowness
  - Real time CBL processing
  - Additional post processing module available in WellCAD

**MECHANICAL TOOL**

**QL40 CAL**
- 3 Arm Caliper
- Temperature - Pressure: 0-70°C (32-158°F), 200 bar (2900 psi)
- Diameter - Length: 40 mm (1.6") - 1.87 m (73")
- Weight: 8.7 kg
- Measurements/Features: 
  - Calibrated measurement of borehole diameter in inches, centimeters or millimeters
  - Easy exchangeable short and long caliper arms and wear lips

**DEVIATION TOOL**

**QL40 DEV**
- Borehole Deviation
- Sensor: APS44-3 axis magnetometer and accelerometer
- Temperature - Pressure: 0-70°C (32-158°F), 200 bar (2900 psi)
- Diameter - Length: 40 mm (1.6") - 0.7 m (28")
- Weight: 5.3 kg (12 lbs)
- Measurements/Features: 
  - Angular values of azimuth, tilt and relative bearing
  - Calibrated values of each accelerometer and magnetometer components

**MAGNETIC TOOL**

**QL40 MGS**
- Magnetic Susceptibility
- Sensor: Bartington : 1.36 kHz Focused Dual Coil system
- Temperature - Pressure: 0-70°C (32-158°F), 200 bar (2900 psi)
- Diameter - Length: Bartington : 43 mm (1.7") - 1.4 m (56")
- W-R : 45mm (1.6") - 1.1m (43")
- Weight: Bartington : 6.1 kg (13 lbs)
  W-R : 7 kg (15.4 lbs)
- Measurements/Features: 
  - Magnetic susceptibility in CGS unit
**FLUID PROPERTIES TOOLS**

**QL40 SFM**
Bi-directional spinner Flowmeter

- **Temperature - Pressure**
  0-70°C (32-158°F)
  200 bar (2900 psi)

- **Diameter - Length**
  40 mm (1.6'') excluding cage
  0.9 m (35.4'')

- **Weight**
  3.2 kg (7 lbs)

- **Measurements/Features**
  - 60mm diameter pitch impeller
  - 75mm diameter pitch impeller/100mm diameter cage
  - Spinner speed in cps up and down

**QL40 FTC-i & FTC-b**
Fluid Temperature and Conductivity

- **Temperature - Pressure**
  0-70°C (32-158°F)
  200 bar (2900 psi)

- **Diameter - Length**
  Bottom sub: 40mm (1.6'') – 0.78m (30.7'')
  In line sub: 50mm (2'') – 0.94m (37'')

- **Weight**
  Bottom sub: 3.3kg (7.27lbs)
  In line sub: 6.2kg (13.6lbs)

- **Measurements/Features**
  - Fluid temperature in °C
  - Fluid conductivity in μS/cm or mS/cm
  - Compensated conductivity at 25°C in μS/cm or mS/cm

**QL40 OCEAN 303**
Water Quality Probe

- **Sensor**
  Idronaut ocean seven 303, Pressure, Temp, Fluid Conductivity, Oxygen, PH, Redox

- **Temperature - Pressure**
  0-70°C (32-158°F)
  150 bar (2175 psi)

- **Diameter - Length**
  44 mm (1.7'') - 1.4 m (55'')

- **Weight**
  4.9 kg (10.8 lbs)

- **Measurements/Features**
  - Pressure : in dbar
  - Temperature : in °C
  - Conductivity: Salt water : in mS/cm
  - Fresh water : in μS/cm
  - Oxygen : in ppm.
  - pH
  - Redox : in mV

**ELECTRICAL TOOLS**

**QL40 ELOG**
Normal Resistivity (8'', 16'',32'', 64'', SP & SPR)

- **Temperature - Pressure**
  0-70°C (32-158°F)
  200 bar (2900 psi)

- **Diameter - Length**
  43 mm (1.7'')
  1.9 m (75'')

- **Weight**
  9 kg (19.8 lbs)

- **Measurements/Features**
  - 8", 16", 32" and 64" Normal Resistivity in [Ohm-m]
  - SP in [mV]
  - SPR in [Ohm]
  - Current (mA)

**QL40 IP**
Induced Polarization and Normal Resistivity (8'', 16'',32'', 64'', SP & SPR)

- **Temperature - Pressure**
  0-70°C (32-158°F)
  200 bar (2900 psi)

- **Diameter - Length**
  43 mm (1.7'')
  1.9 m (35'')

- **Weight**
  9 kg (19.8 lbs)

- **Measurements/Features**
  - Chargeability Ma in [ms] on 16" and 64" electrodes
  - 2 spacing full wave data
  - 8", 16", 32" and 64" Normal Resistivity in [Ohm-m]
  - SP in [mV]
  - SPR in [Ohm]

**QL40 DLL3**
Dual Laterolog

- **Temperature - Pressure**
  0-70°C (32-158°F)
  200 bar (2900 psi)

- **Diameter - Length**
  43 mm (1.7'')
  2.83 m (111.4'')

- **Weight**
  15 kg (33 lbs)

- **Measurements/Features**
  - Time Multiplex dual spacing focused resistivity LL3-S & LL3-D in [Ohm.m]
  - Potential value on measuring and guard electrodes in [V]
  - Current value on measuring and guard electrodes in [mA]
**ELECTRICAL TOOL**

**QL40 IND**

**Dual Induction Probe**

**Sensor**
- Dual coil system with intercoil spacing: 50 & 80 cm
- Operating Frequency: 100 kHz

**Temperature - Pressure**
- 0-70°C (32-158°F)
- 200 bar (2900 psi)

**Diameter - Length**
- 45 mm (1.77")
- 1.925 m (75.78")

**Weight**
- 7 kg (15.4 lbs)

**Measurements/Features**
- Medium Induction: mS/m
- Deep Induction: mS/m

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**NUCLEAR TOOLS**

**QL40 GR**

**Total Count Natural Gamma**

**Sensor**
- NaI (Tl) crystal (1 x 3")

**Temperature - Pressure**
- 0-70°C (32-158°F)
- 200 bar (2900 psi)

**Diameter - Length**
- 40 mm (1.6") - 0.9 m (35")

**Weight**
- 4.3 kg (9.5 lbs)

**Measurements/Features**
- Total gamma counts in CPS and/or API unit

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**QL40 GR-CCL**

**Natural Gamma & Casing Collar Locator**

**Sensor**
- GR: NaI (Tl) crystal (1 x 3")
- CCL: 32 x 280 mm coils & magnets assembly

**Temperature - Pressure**
- 0-70°C (32-158°F)
- 200 bar (2900 psi)

**Diameter - Length**
- 40 mm (1.6") - 1.16 m (46")

**Weight**
- 5.9 kg (13 lbs)

**Measurements/Features**
- Total gamma counts in CPS and/or API unit
- CCL in mV

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**QL40 SGR**

**Natural Spectral Gamma**

**Sensor**
- NaI (Tl) crystal (1 x 4")
- BGO crystal (1 x 4")

**Temperature - Pressure**
- 0-70°C (32-158°F)
- 200 bar (2900 psi)

**Diameter - Length**
- 40 mm (1.6") - 0.93 m (36")

**Weight**
- 4.4 kg (9.6 lbs)

**Measurements/Features**
- 256 channels spectrum
- Spectrum stabilized (software)
- Nuclides concentrations
- Window gamma counts
- Total gamma counts in CPS and/or API unit

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**QL40 DEN**

**Formation Density Sonde**

**Sensor**
- CSI (Tl) crystals
- SSD (20cm) and LSD (35cm)

**Temperature - Pressure**
- 0-70°C (32-158°F)
- 200 bar (2900 psi)

**Diameter - Length**
- 50 mm (2") - 1.9 m (75")

**Weight**
- 20 kg (44 lbs)

**Measurements/Features**
- SSD: in CPS
- LSD: in CPS
- SSD density: in g/cc
- LSD density: in g/cc
- Compensated density: in g/cc
- Caliper: in mm or inch
- PE option

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**QL40 NEU**

**Neutron - Thermal Neutron**

**Sensor**
- Single He-3 thermal neutron detector

**Temperature - Pressure**
- 0-70°C (32-158°F)
- 200 bar (2900 psi)

**Diameter - Length**
- 40 mm (1.6") - 1.34 m (46")

**Weight**
- 5.5 kg (12 lbs)

**Range**
- 0 - 100,000 CPS

**Measurements/Features**
- Qualitative measurement of formation porosity in open and cased holes.
- Measures hydrogen content of formation.