

# ABI40/ABI40.GR

## QL40.ABI acoustic borehole imager

The acoustic borehole imager generates a 3D image from the borehole wall. The tool emits ultrasound pulses towards the formation and records the amplitude and the travel time of the reflected signal. A built in high precision orientation package incorporating a 3-axis magnetometer and 3-axis accelerometer allows orientation of the images to a global reference and determination of the borehole's azimuth and inclination.

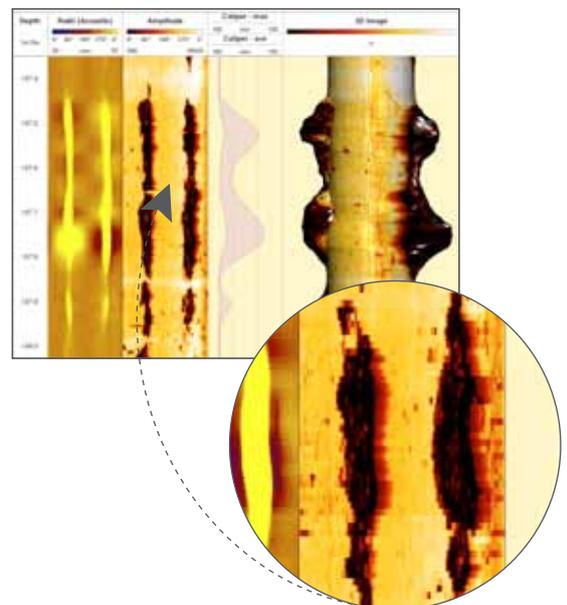
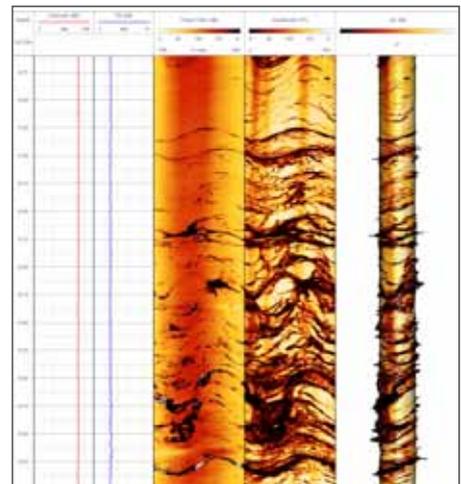
The amplitude of the reflection from the borehole wall is representative of the acoustic (elastic properties) of the formation. The travel time is used to determine exceptionally accurate borehole diameter data, which makes the tool ideal for borehole deformation description (stress field analysis) and casing inspection. Cement bond quality can be checked if the reflection signal from behind the casing is analysed.

The QL40 ABI is a bottom 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.

The ABI40.GR has an integrated natural gamma sensor.

### Application

- Detailed and oriented caliper and structural information
- Borehole deformation (stress field analysis)
- Fracture detection and evaluation
- Breakout analysis
- Detection of thin beds
- Determination of bedding dip
- Lithology characterizations
- Rock strength
- Casing inspection
- Steel casing thickness



# ABI40, ABI40 GR QL40, ABI acoustic borehole imager

## Principle of measurement

The tool generates an image of the borehole wall by transmitting ultrasound pulses and recording the amplitude and the travel time of the reflected signal. The ABI is capable of detecting multiple reflections. This multi-echo system is achieved by digital recording of the reflected acoustic wave train. On line analysis of the acoustic data is made by a DSP (Digital Signal Processor). Sophisticated algorithms allow the system to detect the reflexion from the acoustic window and to separate all subsequent echoes.

- Direct linear 14 Bit, 10MHz A/D conversion (automatic gain settings)
- Dynamic range of amplitude measurement is 84dB
- Caliper resolution is better than 0.1mm
- Increased telemetry bandwidth (data transmission rate up to 500 Kbits depending on wireline), 166 kbps typical on 3000m four-conductor.
- Full wave form recording and real time display for quality control
- Multiecho mode to realize acoustic measurements through plastic pipes (require the plastic pipe to be centralized inside the borehole).
- Pipe-inspection mode to detect inner corrosion, outer corrosion, and wall thickness\*
- Automatic optimization of measurement window under all borehole conditions
- Very high travel time resolution

## Measurements / Features

- 360° orientated acoustic image (amplitude & travel time)
- Borehole azimuth and dip
- Tool internal temperature
- Relative bearing
- Magnetic field
- Gravity

## Operating Conditions

- Water filled hole
- Open & cased hole
- Centralisation necessary
- Compatible with ALTLogger & Matrix
- Digital data transmission up to 500 Kbit per second depending on wireline
- Real time automatic telemetry tuning according to the cable length/type
- Measurement range : 2" to 20" borehole depending on mud conditions
- Logging speed : variable, function of resolution and wireline. i.e 2.0 m/min for 144 pt @ 3mm int.

## Technical Specifications

- Diameter : 40mm (1,575")
- Length (min/max): 1.61/2,12 m (63/83")
- Weight (min/max): 6,7/8,7 kgs (14,7/19,2 lbs)
- Max temp : 70°C
- Max pressure : 200 bar

### Acoustic sensor

- Fixed transducer and rotating focusing mirror
- Focus optimized for 6" borehole (152mm)
- Frequency : 1.2 Mhz
- Acoustic beam width : 1.5 mm (-3db) focal distance
- Rotation speed : up to 12 revolutions per second - automatic
- Samples per revolution : 72, 144, 288 user defined
- Caliper resolution : 0.08mm (0,003")

### Orientation sensor

- APS 544 - 3-axis magnetometer – 3-axis accelerometer
- Inclination accuracy : +/- 0.5 degree
- Azimuth accuracy : +/- 1.2 degree

### Natural gamma ray sensor

- 0,875" x 3" NaI (Ti) scintillation crystal

The specifications are not contractual and are subject to modification without notice.