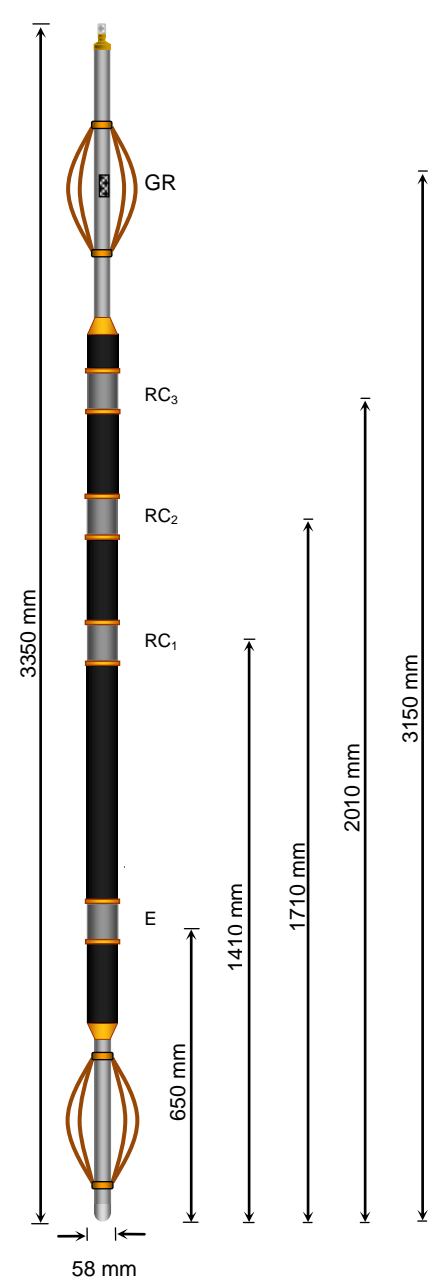
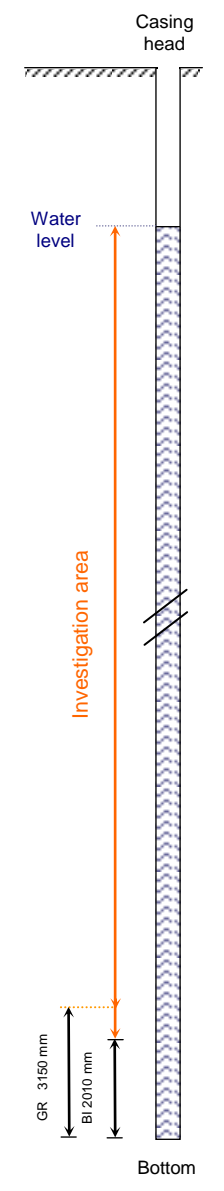


## TECHNICAL SHEET

<b>ACOUSTIC</b>	<b>CEMENT BOND LOG CBL</b>	<b>FWS</b>
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<p style="text-align: center; background-color: #cccccc; margin: -10px -10px 10px -10px;"><b>Generalities</b></p> <p><b>Principle</b> A piezo-electric transmitter stimulated by a high-voltage pulse radiates a high-frequency acoustic wavelet. This is coupled via the borehole fluid and formation to each receiver. The probe records the amplitude and arrival time of the first casing arrival (P wave) at the receivers.</p> <p><b>Result</b> VDL, depth-based curves of bond index (BI), arrival time and amplitude of the first casing arrival.</p> <p><b>Interest</b> Estimation of steel casing cementation quality.</p> <p><b>Option</b> Natural gamma sensor.</p>																														
<p style="text-align: center; background-color: #cccccc; margin: -10px -10px 10px -10px;"><b>Constraints / borehole</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">filling up</td> <td style="width: 10%;">: <input checked="" type="checkbox"/> water</td> <td style="width: 10%;">: <input checked="" type="checkbox"/> mud</td> <td style="width: 10%;">: <input type="checkbox"/> dry</td> </tr> <tr> <td>casing</td> <td>: <input type="checkbox"/> PVC</td> <td>: <input checked="" type="checkbox"/> steel</td> <td>: <input type="checkbox"/> open</td> </tr> <tr> <td>borehole</td> <td>: <input checked="" type="checkbox"/> cored</td> <td>: <input checked="" type="checkbox"/> destructive</td> <td></td> </tr> <tr> <td>max. depth</td> <td colspan="3">: 2000 m</td> </tr> <tr> <td>effective diam.</td> <td colspan="3">: 70 mm – 600 mm</td> </tr> <tr> <td>temperature</td> <td colspan="3">: 0 - 70 °C</td> </tr> <tr> <td>max. pressure</td> <td colspan="3">: 200 bars</td> </tr> </table>	filling up	: <input checked="" type="checkbox"/> water	: <input checked="" type="checkbox"/> mud	: <input type="checkbox"/> dry	casing	: <input type="checkbox"/> PVC	: <input checked="" type="checkbox"/> steel	: <input type="checkbox"/> open	borehole	: <input checked="" type="checkbox"/> cored	: <input checked="" type="checkbox"/> destructive		max. depth	: 2000 m			effective diam.	: 70 mm – 600 mm			temperature	: 0 - 70 °C			max. pressure	: 200 bars				
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<p style="text-align: center; background-color: #cccccc; margin: -10px -10px 10px -10px;"><b>Technical specifications</b></p> <p><b>Dimensions</b></p> <ul style="list-style-type: none"> <li>• length : 3350 mm</li> <li>• diameter : 58 mm</li> <li>• weight : 25 Kg</li> </ul> <p><b>Elements</b></p> <ul style="list-style-type: none"> <li>• 1 emitter (14 kHz) : E</li> <li>• 3 receivers (2 ft, 3 ft and 4 ft) : RC<sub>1</sub>, RC<sub>2</sub>, RC<sub>3</sub></li> <li>• 1 natural gamma sensor : GR</li> </ul>																														

Records / Measures	
<p><b>Records</b></p> <ul style="list-style-type: none"> <li>• Tool : <input checked="" type="checkbox"/> centered    <input type="checkbox"/> off-centered</li> <li>• Measure : <input checked="" type="checkbox"/> down    <input checked="" type="checkbox"/> up</li> <li>• Rec. speed : 8 m/min</li> <li>• Sampling : 5 cm (spatial) ; 4 μs (temporal)</li> </ul>	<p><b>Measures</b></p> <ul style="list-style-type: none"> <li>• BI range : 0 - 100 %</li> <li>• P range : 40-200 μs/ft</li> <li>• Resolution : 0,1 % of the measure</li> <li>• Vert. resolution : 5 cm</li> <li>• Accuracy : 5 % of the measure</li> </ul>

## Example

